

EXPRESS MAIL NO. EV336654780US

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SEQUENCE LISTING

<110> FURUSAWA, Mitsuru

<120> Method and system for rapidly conferring a desired trait to an organism

<130> NE0001-1US

<150> JP 2003-92898

<151> 2003-3-28

<150> US 10/684,141

<151> 2003-10-10

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<170> Patent/n Ver. 2.1

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gaattgogtg agtttgctaa agtagoggaa ttcaagatc caagtttgag totcgtggtg 6900
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ootgaatota tttttcatg cgtcagatgt cacaagoot ttaataaagt attgttgoaa 7020
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tgctccagat gtcataaagt gaaacgtgac tatatgagtg oocaotgtcc atgtgccggc 7140
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aaaaaaaggg taaggaaaaa gagtattttc aattcgttto tgaacatata aatataaata 7380
accgaaaaat tagcccttga acataattaa caotottott tgatatttaa atocaaagta 7440
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7505

<210> 4

<211> 2222

<212> PRT

<213> *Saccharomyces cerevisiae*

<400> 4

Met Met Phe Gly Lys Lys Lys Asn Asn Gly Gly Ser Ser Thr Ala Arg

13/236

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Tyr Ser Ala Gly Asn Lys Tyr Asn Thr Leu Ser Asn Asn Tyr Ala Leu			
20	25	30	
Ser Ala Gln Gln Leu Leu Asn Ala Ser Lys Ile Asp Asp Ile Asp Ser			
35	40	45	
Met Met Gly Phe Glu Arg Tyr Val Pro Pro Gln Tyr Asn Gly Arg Phe			
50	55	60	
Asp Ala Lys Asp Ile Asp Gln Ile Pro Gly Arg Val Gly Trp Leu Thr			
65	70	75	80
Asn Met His Ala Thr Leu Val Ser Gln Glu Thr Leu Ser Ser Gly Ser			
85	90	95	
Asn Gly Gly Gly Asn Ser Asn Asp Gly Glu Arg Val Thr Thr Asn Gln			
100	105	110	
Gly Ile Ser Gly Val Asp Phe Tyr Phe Leu Asp Glu Glu Gly Gly Ser			
115	120	125	
Phe Lys Ser Thr Val Val Tyr Asp Pro Tyr Phe Phe Ile Ala Cys Asn			
130	135	140	
Asp Glu Ser Arg Val Asn Asp Val Glu Glu Leu Val Lys Lys Tyr Leu			
145	150	155	160
Glu Ser Cys Leu Lys Ser Leu Gln Ile Ile Arg Lys Glu Asp Leu Thr			
165	170	175	
Met Asp Asn His Leu Leu Gly Leu Gln Lys Thr Leu Ile Lys Leu Ser			
180	185	190	
Phe Val Asn Ser Asn Gln Leu Phe Glu Ala Arg Lys Leu Leu Arg Pro			
195	200	205	

14/236

Ile Leu Gln Asp Asn Ala Asn Asn Asn Val Gln Arg Asn Ile Tyr Asn
210 215 220

Val Ala Ala Asn Gly Ser Glu Lys Val Asp Ala Lys His Leu Ile Glu
225 230 235 240

Asp Ile Arg Glu Tyr Asp Val Pro Tyr His Val Arg Val Ser Ile Asp
245 250 255

Lys Asp Ile Arg Val Gly Lys Trp Tyr Lys Val Thr Gln Gln Gly Phe
260 265 270

Ile Glu Asp Thr Arg Lys Ile Ala Phe Ala Asp Pro Val Val Met Ala
275 280 285

Phe Asp Ile Glu Thr Thr Lys Pro Pro Leu Lys Phe Pro Asp Ser Ala
290 295 300

Val Asp Gln Ile Met Met Ile Ser Tyr Met Ile Asp Gly Glu Gly Phe
305 310 315 320

Leu Ile Thr Asn Arg Glu Ile Ile Ser Glu Asp Ile Glu Asp Phe Glu
325 330 335

Tyr Thr Pro Lys Pro Glu Tyr Pro Gly Phe Phe Thr Ile Phe Asn Glu
340 345 350

Asn Asp Glu Val Ala Leu Leu Gln Arg Phe Phe Glu His Ile Arg Asp
355 360 365

Val Arg Pro Thr Val Ile Ser Thr Phe Asn Gly Asp Phe Phe Asp Trp
370 375 380

Pro Phe Ile His Asn Arg Ser Lys Ile His Gly Leu Asp Met Phe Asp
385 390 395 400

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Glu Ile Gly Phe Ala Pro Asp Ala Glu Gly Glu Tyr Lys Ser Ser Tyr
405 410 415

Cys Ser His Met Asp Cys Phe Arg Trp Val Lys Arg Asp Ser Tyr Leu
420 425 430

Pro Gln Gly Ser Gln Gly Leu Lys Ala Val Thr Gln Ser Lys Leu Gly
435 440 445

Tyr Asn Pro Ile Glu Leu Asp Pro Glu Leu Met Thr Pro Tyr Ala Phe
450 455 460

Glu Lys Pro Gln His Leu Ser Glu Tyr Ser Val Ser Asp Ala Val Ala
465 470 475 480

Thr Tyr Tyr Leu Tyr Met Lys Tyr Val His Pro Phe Ile Phe Ser Leu
485 490 495

Cys Thr Ile Ile Pro Leu Asn Pro Asp Glu Thr Leu Arg Lys Gly Thr
500 505 510

Gly Thr Leu Cys Glu Met Leu Leu Met Val Gln Ala Tyr Gln His Asn
515 520 525

Ile Leu Leu Pro Asn Lys His Thr Asp Pro Ile Glu Arg Phe Tyr Asp
530 535 540

Gly His Leu Leu Glu Ser Glu Thr Tyr Val Gly Gly His Val Glu Ser
545 550 555 560

Leu Glu Ala Gly Val Phe Arg Ser Asp Leu Lys Asn Glu Phe Lys Ile
565 570 575

Asp Pro Ser Ala Ile Asp Glu Leu Leu Gln Glu Leu Pro Glu Ala Leu
580 585 590

Lys Phe Ser Val Glu Val Glu Asn Lys Ser Ser Val Asp Lys Val Thr

16/236

595	600	605
Asn Phe Glu Glu Ile Lys Asn Gln Ile Thr Gln Lys Leu Leu Glu Leu		
610	615	620
Lys Glu Asn Asn Ile Arg Asn Glu Leu Pro Leu Ile Tyr His Val Asp		
625	630	635 640
Val Ala Ser Met Tyr Pro Asn Ile Met Thr Thr Asn Arg Leu Gln Pro		
645	650	655
Asp Ser Ile Lys Ala Glu Arg Asp Cys Ala Ser Cys Asp Phe Asn Arg		
660	665	670
Pro Gly Lys Thr Cys Ala Arg Lys Leu Lys Trp Ala Trp Arg Gly Glu		
675	680	685
Phe Phe Pro Ser Lys Met Asp Glu Tyr Asn Met Ile Lys Arg Ala Leu		
690	695	700
Gln Asn Glu Thr Phe Pro Asn Lys Asn Lys Phe Ser Lys Lys Lys Val		
705	710	715 720
Leu Thr Phe Asp Glu Leu Ser Tyr Ala Asp Gln Val Ile His Ile Lys		
725	730	735
Lys Arg Leu Thr Glu Tyr Ser Arg Lys Val Tyr His Arg Val Lys Val		
740	745	750
Ser Glu Ile Val Glu Arg Glu Ala Ile Val Cys Gln Arg Glu Asn Pro		
755	760	765
Phe Tyr Val Asp Thr Val Lys Ser Phe Arg Asp Arg Arg Tyr Glu Phe		
770	775	780
Lys Gly Leu Ala Lys Thr Trp Lys Gly Asn Leu Ser Lys Ile Asp Pro		
785	790	795 800

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Ser Asp Lys His Ala Arg Asp Glu Ala Lys Lys Met Ile Val Leu Tyr
805 810 815

Asp Ser Leu Gln Leu Ala His Lys Val Ile Leu Asn Ser Phe Tyr Gly
820 825 830

Tyr Val Met Arg Lys Gly Ser Arg Trp Tyr Ser Met Glu Met Ala Gly
835 840 845

Ile Thr Cys Leu Thr Gly Ala Thr Ile Ile Gln Met Ala Arg Ala Leu
850 855 860

Val Glu Arg Val Gly Arg Pro Leu Glu Leu Asp Thr Asp Gly Ile Trp
865 870 875 880

Cys Ile Leu Pro Lys Ser Phe Pro Glu Thr Tyr Phe Phe Thr Leu Glu
885 890 895

Asn Gly Lys Lys Leu Tyr Leu Ser Tyr Pro Cys Ser Met Leu Asn Tyr
900 905 910

Arg Val His Gln Lys Phe Thr Asn His Gln Tyr Gln Glu Leu Lys Asp
915 920 925

Pro Leu Asn Tyr Ile Tyr Glu Thr His Ser Glu Asn Thr Ile Phe Phe
930 935 940

Glu Val Asp Gly Pro Tyr Lys Ala Met Ile Leu Pro Ser Ser Lys Glu
945 950 955 960

Glu Gly Lys Gly Ile Lys Lys Arg Tyr Ala Val Phe Asn Glu Asp Gly
965 970 975

Ser Leu Ala Glu Leu Lys Gly Phe Glu Leu Lys Arg Arg Gly Glu Leu
980 985 990

18/236

Gln Leu Ile Lys Asn Phe Gln Ser Asp Ile Phe Lys Val Phe Leu Glu
995 1000 1005

Gly Asp Thr Leu Glu Gly Cys Tyr Ser Ala Val Ala Ser Val Cys Asn
1010 1015 1020

Arg Trp Leu Asp Val Leu Asp Ser His Gly Leu Met Leu Glu Asp Glu
1025 1030 1035 1040

Asp Leu Val Ser Leu Ile Cys Glu Asn Arg Ser Met Ser Lys Thr Leu
1045 1050 1055

Lys Glu Tyr Glu Gly Gln Lys Ser Thr Ser Ile Thr Thr Ala Arg Arg
1060 1065 1070

Leu Gly Asp Phe Leu Gly Glu Asp Met Val Lys Asp Lys Gly Leu Gln
1075 1080 1085

Cys Lys Tyr Ile Ile Ser Ser Lys Pro Phe Asn Ala Pro Val Thr Glu
1090 1095 1100

Arg Ala Ile Pro Val Ala Ile Phe Ser Ala Asp Ile Pro Ile Lys Arg
1105 1110 1115 1120

Ser Phe Leu Arg Arg Trp Thr Leu Asp Pro Ser Leu Glu Asp Leu Asp
1125 1130 1135

Ile Arg Thr Ile Ile Asp Trp Gly Tyr Tyr Arg Glu Arg Leu Gly Ser
1140 1145 1150

Ala Ile Gln Lys Ile Ile Thr Ile Pro Ala Ala Leu Gln Gly Val Ser
1155 1160 1165

Asn Pro Val Pro Arg Val Glu His Pro Asp Trp Leu Lys Arg Lys Ile
1170 1175 1180

Ala Thr Lys Glu Asp Lys Phe Lys Gln Thr Ser Leu Thr Lys Phe Phe

19/236

1185	1190	1195	1200
Ser Lys Thr Lys Asn Val	Pro Thr Met Gly Lys Ile Lys Asp Ile Glu		
1205	1210	1215	
Asp Leu Phe Glu Pro Thr Val	Glu Glu Asp Asn Ala Lys Ile Lys Ile		
1220	1225	1230	
Ala Arg Thr Thr Lys Lys Lys Ala Val	Ser Lys Arg Lys Arg Asn Gln		
1235	1240	1245	
Leu Thr Asn Glu Glu Asp Pro Leu Val	Leu Pro Ser Glu Ile Pro Ser		
1250	1255	1260	
Met Asp Glu Asp Tyr Val Gly Trp Leu Asn Tyr Gln Lys Ile Lys Trp			
1265	1270	1275	1280
Lys Ile Gln Ala Arg Asp Arg Lys Arg Arg Asp Gln Leu Phe Gly Asn			
1285	1290	1295	
Thr Asn Ser Ser Arg Glu Arg Ser Ala Leu Gly Ser Met Ile Arg Lys			
1300	1305	1310	
Gln Ala Glu Ser Tyr Ala Asn Ser Thr Trp Glu Val Leu Gln Tyr Lys			
1315	1320	1325	
Asp Ser Gly Glu Pro Gly Val Leu Glu Val Phe Val Thr Ile Asn Gly			
1330	1335	1340	
Lys Val Gln Asn Ile Thr Phe His Ile Pro Lys Thr Ile Tyr Met Lys			
1345	1350	1355	1360
Phe Lys Ser Gln Thr Met Pro Leu Gln Lys Ile Lys Asn Cys Leu Ile			
1365	1370	1375	
Glu Lys Ser Ser Ala Ser Leu Pro Asn Asn Pro Lys Thr Ser Asn Pro			
1380	1385	1390	

20/236

Ala Gly Gly Gln Leu Phe Lys Ile Thr Leu Pro Glu Ser Val Phe Leu
1395 1400 1405

Glu Glu Lys Glu Asn Cys Thr Ser Ile Phe Asn Asp Glu Asn Val Leu
1410 1415 1420

Gly Val Phe Glu Gly Thr Ile Thr Pro His Gln Arg Ala Ile Met Asp
1425 1430 1435 1440

Leu Gly Ala Ser Val Thr Phe Arg Ser Lys Ala Met Gly Ala Leu Gly
1445 1450 1455

Lys Gly Ile Gln Gln Gly Phe Glu Met Lys Asp Leu Ser Met Ala Glu
1460 1465 1470

Asn Glu Arg Tyr Leu Ser Gly Phe Ser Met Asp Ile Gly Tyr Leu Leu
1475 1480 1485

His Phe Pro Thr Ser Ile Gly Tyr Glu Phe Phe Ser Leu Phe Lys Ser
1490 1495 1500

Trp Gly Asp Thr Ile Thr Ile Leu Val Leu Lys Pro Ser Asn Gln Ala
1505 1510 1515 1520

Gln Glu Ile Asn Ala Ser Ser Leu Gly Gln Ile Tyr Lys Gln Met Phe
1525 1530 1535

Glu Lys Lys Lys Gly Lys Ile Glu Thr Tyr Ser Tyr Leu Val Asp Ile
1540 1545 1550

Lys Glu Asp Ile Asn Phe Glu Phe Val Tyr Phe Thr Asp Ile Ser Lys
1555 1560 1565

Leu Tyr Arg Arg Leu Ser Gln Glu Thr Thr Lys Leu Lys Glu Glu Arg
1570 1575 1580

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Gly Leu Gln Phe Leu Leu Leu Leu Gln Ser Pro Phe Ile Thr Lys Leu
1585 1590 1595 1600

Leu Gly Thr Ile Arg Leu Leu Asn Gln Met Pro Ile Val Lys Leu Ser
1605 1610 1615

Leu Asn Glu Val Leu Leu Pro Gln Leu Asn Trp Gln Pro Thr Leu Leu
1620 1625 1630

Lys Lys Leu Val Asn His Val Leu Ser Ser Gly Ser Trp Ile Ser His
1635 1640 1645

Leu Ile Lys Leu Ser Gln Tyr Ser Asn Ile Pro Ile Cys Asn Leu Arg
1650 1655 1660

Leu Asp Ser Met Asp Tyr Ile Ile Asp Val Leu Tyr Ala Arg Lys Leu
1665 1670 1675 1680

Lys Lys Glu Asn Ile Val Leu Trp Trp Asn Glu Lys Ala Pro Leu Pro
1685 1690 1695

Asp His Gly Gly Ile Gln Asn Asp Phe Asp Leu Asn Thr Ser Trp Ile
1700 1705 1710

Met Asn Asp Ser Glu Phe Pro Lys Ile Asn Asn Ser Gly Val Tyr Asp
1715 1720 1725

Asn Val Val Leu Asp Val Gly Val Asp Asn Leu Thr Val Asn Thr Ile
1730 1735 1740

Leu Thr Ser Ala Leu Ile Asn Asp Ala Glu Gly Ser Asp Leu Val Asn
1745 1750 1755 1760

Asn Asn Met Gly Ile Asp Asp Lys Asp Ala Val Ile Asn Ser Pro Ser
1765 1770 1775

Glu Phe Val His Asp Ala Phe Ser Asn Asp Ala Leu Asn Val Leu Arg

22/236

1780	1785	1790
Gly Met Leu Lys Glu Trp Trp Asp Glu Ala Leu Lys Glu Asn Ser Thr		
1795	1800	1805
Ala Asp Leu Leu Val Asn Ser Leu Ala Ser Trp Val Gln Asn Pro Asn		
1810	1815	1820
Ala Lys Leu Phe Asp Gly Leu Leu Arg Tyr His Val His Asn Leu Thr		
1825	1830	1835
		1840
Lys Lys Ala Leu Leu Gln Leu Val Asn Glu Phe Ser Ala Leu Gly Ser		
1845	1850	1855
Thr Ile Val Tyr Ala Asp Arg Asn Gln Ile Leu Ile Lys Thr Asn Lys		
1860	1865	1870
Tyr Ser Pro Glu Asn Cys Tyr Ala Tyr Ser Gln Tyr Met Met Lys Ala		
1875	1880	1885
Val Arg Thr Asn Pro Met Phe Ser Tyr Leu Asp Leu Asn Ile Lys Arg		
1890	1895	1900
Tyr Trp Asp Leu Leu Ile Trp Met Asp Lys Phe Asn Phe Ser Gly Leu		
1905	1910	1915
		1920
Ala Cys Ile Glu Ile Glu Glu Lys Glu Asn Gln Asp Tyr Thr Ala Val		
1925	1930	1935
Ser Gln Trp Gln Leu Lys Lys Phe Leu Ser Pro Ile Tyr Gln Pro Glu		
1940	1945	1950
Phe Glu Asp Trp Met Met Ile Ile Leu Asp Ser Met Leu Lys Thr Lys		
1955	1960	1965
Gln Ser Tyr Leu Lys Leu Asn Ser Gly Thr Gln Arg Pro Thr Gln Ile		
1970	1975	1980

23/236

Val Asn Val Lys Lys Gln Asp Lys Glu Asp Ser Val Glu Asn Ser Leu
1985 1990 1995 2000

Asn Gly Phe Ser His Leu Phe Ser Lys Pro Leu Met Lys Arg Val Lys
2005 2010 2015

Lys Leu Phe Lys Asn Gln Gln Glu Phe Ile Leu Asp Pro Gln Tyr Glu
2020 2025 2030

Ala Asp Tyr Val Ile Pro Val Leu Pro Gly Ser His Leu Asn Val Lys
2035 2040 2045

Asn Pro Leu Leu Glu Leu Val Lys Ser Leu Cys His Val Met Leu Leu
2050 2055 2060

Ser Lys Ser Thr Ile Leu Glu Ile Arg Thr Leu Arg Lys Glu Leu Leu
2065 2070 2075 2080

Lys Ile Phe Glu Leu Arg Glu Phe Ala Lys Val Ala Glu Phe Lys Asp
2085 2090 2095

Pro Ser Leu Ser Leu Val Val Pro Asp Phe Leu Cys Glu Tyr Cys Phe
2100 2105 2110

Phe Ile Ser Asp Ile Asp Phe Cys Lys Ala Ala Pro Glu Ser Ile Phe
2115 2120 2125

Ser Cys Val Arg Cys His Lys Ala Phe Asn Gln Val Leu Leu Gln Glu
2130 2135 2140

His Leu Ile Gln Lys Leu Arg Ser Asp Ile Glu Ser Tyr Leu Ile Gln
2145 2150 2155 2160

Asp Leu Arg Cys Ser Arg Cys His Lys Val Lys Arg Asp Tyr Met Ser
2165 2170 2175

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Ala His Cys Pro Cys Ala Gly Ala Trp Glu Gly Thr Leu Pro Arg Glu

2180

2185

2190

Ser Ile Val Gln Lys Leu Asn Val Phe Lys Gln Val Ala Lys Tyr Tyr

2195

2200

2205

Gly Phe Asp Ile Leu Leu Ser Cys Ile Ala Asp Leu Thr Ile

2210

2215

2220

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<212> PRT

<213> Escherichia coli

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Gln Ile Val Leu Asp Thr Glu Thr Thr Gly Met Asn

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5

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<210> 6

<211> 12

<212> PRT

<213> Haemophilus influenzae

<400> 6

Gln Ile Val Leu Asp Thr Glu Thr Thr Gly Met Asn

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<210> 7

<211> 12

<212> PRT

<213> Salmonella typhimurium

25/236

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1 5 10

<210> 8

<211> 12

<212> PRT

<213> *Vibrio cholerae*

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<213> *Pseudomonas aeruginosa*

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1 5 10

<210> 10

<211> 12

<212> PRT

<213> *Neisseria meningitidis*

<400> 10

Gln Ile Ile Leu Asp Thr Glu Thr Thr Gly Leu Tyr

1 5 10

<210> 11

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<211> 12

<212> PRT

<213> *Chlamydia trachomatis*

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1 5 10

<210> 12

<211> 12

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<213> *Streptomyces coelicolor*

<400> 12

Leu Ala Ala Phe Asp Thr Glu Thr Thr Gly Val Asp

1 5 10

<210> 13

<211> 12

<212> PRT

<213> *Shigella flexneri* 2a str. 301

<400> 13

Gln Ile Val Leu Asp Thr Glu Thr Thr Gly Met Asn

1 5 10

<210> 14

<211> 12

<212> PRT

<213> *Staphylococcus aureus*

<400> 14

Tyr Val Val Phe Asp Val Glu Thr Thr Gly Leu Ser

1 5 10

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<210> 15

<211> 12

<212> PRT

<213> *Bacillus subtilis*

<400> 15

Tyr Val Val Phe Asp Val Glu Thr Thr Gly Leu Ser

1

5

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<210> 16

<211> 12

<212> PRT

<213> *Mycoplasma pulmonis*

<400> 16

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<211> 12

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<213> *Mycoplasma genitalium*

<400> 17

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1

5

10

<210> 18

<211> 12

<212> PRT

<213> *Mycoplasma pneumoniae*

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<400> 18

Phe Val Ile Phe Asp Ile Glu Thr Thr Gly Leu His
1 5 10

<210> 19

<211> 12

<212> PRT

<213> *Saccharomyces cerevisiae*

<400> 19

Ile Met Ser Phe Asp Ile Glu Cys Ala Gly Arg Ile
1 5 10

<210> 20

<211> 12

<212> PRT

<213> *Saccharomyces cerevisiae*

<400> 20

Val Met Ala Phe Asp Ile Glu Thr Thr Lys Pro Pro
1 5 10

<210> 21

<211> 12

<212> PRT

<213> *Mus musculus*

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1 5 10

<210> 22

<211> 12

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<212> PRT

<213> *Mus musculus*

<400> 22

Val Leu Ala Phe Asp Ile Glu Thr Thr Lys Leu Pro
1 5 10

<210> 23

<211> 12

<212> PRT

<213> *Homo sapiens*

<400> 23

Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys
1 5 10

<210> 24

<211> 12

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<213> *Homo sapiens*

<400> 24

Val Leu Ala Phe Asp Ile Glu Thr Thr Lys Leu Pro
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<210> 25

<211> 12

<212> PRT

<213> *Oryza sativa*

<400> 25

Ile Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys
1 5 10

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<210> 26

<211> 12

<212> PRT

<213> *Arabidopsis thaliana*

<400> 26

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1

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<210> 27

<211> 12

<212> PRT

<213> *Arabidopsis thaliana*

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10

<210> 28

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<213> *Rattus norvegicus*

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<210> 29

<211> 12

<212> PRT

<213> *Bos taurus*

<400> 29

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Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys
1 5 10

<210> 30
<211> 12
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<213> Glycine max

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Ile Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys
1 5 10

<210> 31
<211> 12
<212> PRT
<213> Drosophila melanogaster

<400> 31
Ile Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys
1 5 10

<210> 32
<211> 12
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<213> Drosophila melanogaster

<400> 32
Val Leu Ala Phe Asp Ile Glu Thr Thr Lys Leu Pro
1 5 10

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<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Mutated pol delta

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36

<210> 34

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Mutated pol delta

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1

5

10

<210> 35

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Mutated pol epsilon

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36

<210> 36

<211> 7

<212> PRT

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<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Mutated pol epsilon

<400> 36

Val	Met	Ala	Phe	Ala	Ile	Ala	Thr	Thr	Lys	Pro	Pro
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<210> 37

<211> 14

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Primer

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<210> 38

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Primer

<400> 38

CCCGCGGCG GTTACCATTT GCTTAATTGT 30

<210> 39

<211> 12

<212> DNA

34/236

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Primer

<400> 39

CCCGAGCTCA TGATGTTGG CAAGAAAAA 30

<210> 40

<211> 16

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Primer

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<210> 41

<211> 1592

<212> DNA

<213> Escherichia coli

<400> 41

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<210> 42

<211> 243

<212> PRT

<213> Escherichia coli

<400> 42

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Gly Met Asn Gln Ile Gly Ala His Tyr Glu Gly His Lys Ile Ile Glu
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Ile Gly Ala Val Glu Val Val Asn Arg Arg Leu Thr Gly Asn Asn Phe
 35 40 45

His Val Tyr Leu Lys Pro Asp Arg Leu Val Asp Pro Glu Ala Phe Gly
 50 55 60

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Val His Gly Ile Ala Asp Glu Phe Leu Leu Asp Lys Pro Thr Phe Ala
65 70 75 80

Glu Val Ala Asp Glu Phe Met Asp Tyr Ile Arg Gly Ala Glu Leu Val
85 90 95

Ile His Asn Ala Ala Phe Asp Ile Gly Phe Met Asp Tyr Glu Phe Ser
100 105 110

Leu Leu Lys Arg Asp Ile Pro Lys Thr Asn Thr Phe Cys Lys Val Thr
115 120 125

Asp Ser Leu Ala Val Ala Arg Lys Met Phe Pro Gly Lys Arg Asn Ser
130 135 140

Leu Asp Ala Leu Cys Ala Arg Tyr Glu Ile Asp Asn Ser Lys Arg Thr
145 150 155 160

Leu His Gly Ala Leu Leu Asp Ala Gln Ile Leu Ala Glu Val Tyr Leu
165 170 175

Ala Met Thr Gly Gly Gln Thr Ser Met Ala Phe Ala Met Glu Gly Glu
180 185 190

Thr Gln Gln Gln Gln Gly Glu Ala Thr Ile Gln Arg Ile Val Arg Gln
195 200 205

Ala Ser Lys Leu Arg Val Val Phe Ala Thr Asp Glu Glu Ile Ala Ala
210 215 220

His Glu Ala Arg Leu Asp Leu Val Gln Lys Lys Gly Gly Ser Cys Leu
225 230 235 240

Trp Arg Ala

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<210> 43

<211> 4866

<212> DNA

<213> *Bacillus subtilis*

<400> 43

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 ccagatcttc agcttgagaa atacagggaa gggottotga toggttotgo ttgtgacagg 2040
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<210> 44

<211> 1437

<212> PRT

<213> *Bacillus subtilis*

<400> 44

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Gln Ile Asn Met Thr Asp Asp Thr Phe Met Thr Tyr Phe Glu His Gly
 20 25 30

Glu Ile Lys Lys Leu Thr Ile His Lys Ala Ser Lys Ser Trp His Phe
 35 40 45

His Phe Gln Phe Lys Ser Leu Leu Pro Phe Gln Ile Tyr Asp Thr Leu
 50 55 60

Thr Thr Arg Leu Thr Gln Ser Phe Ala His Ile Ala Lys Val Thr Ser
 65 70 75 80

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Ser Ile Glu Val Gln Asp Ala Glu Val Ser Glu Ser Ile Val Gln Asp
85 90 95

Tyr Trp Ser Arg Cys Ile Glu Glu Leu Gln Gly Ile Ser Pro Pro Ile
100 105 110

Ile Ser Leu Leu Asn Gln Gln Lys Pro Lys Leu Lys Gly Asn Lys Leu
115 120 125

Ile Val Lys Thr Lys Thr Asp Thr Glu Ala Ala Ala Leu Lys Asn Lys
130 135 140

Tyr Ser Ser Met Ile Gln Ala Glu Tyr Arg Gln Phe Gly Phe Pro Asp
145 150 155 160

Leu Gln Leu Asp Ala Glu Ile Phe Val Ser Glu Gln Glu Val Gln Lys
165 170 175

Phe Arg Glu Gln Lys Leu Ala Glu Asp Gln Glu Arg Ala Met Gln Ala
180 185 190

Leu Ile Glu Met Glu Lys Lys Asp Lys Glu Ser Asp Glu Asp Gln Ala
195 200 205

Pro Ser Gly Pro Leu Val Ile Gly Tyr Gln Ile Lys Asp Asn Glu Glu
210 215 220

Ile Arg Thr Leu Asp Ser Ile Met Asp Glu Glu Arg Arg Ile Thr Val
225 230 235 240

Gln Gly Tyr Val Phe Asp Val Glu Thr Arg Glu Leu Lys Ser Gly Arg
245 250 255

Thr Leu Cys Ile Phe Lys Ile Thr Asp Tyr Thr Asn Ser Ile Leu Ile
260 265 270

Lys Met Phe Ala Arg Glu Lys Glu Asp Ala Ala Leu Met Lys Ser Leu

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275	280	285
Lys Lys Gly Met Trp Val	Lys Ala Arg Gly Ser Ile	Gln Asn Asp Thr
290	295	300
Phe Val Arg Asp Leu Val	Met Ile Ala Asn Asp Val	Asn Glu Ile Lys
305	310	315 320
Ala Lys Thr Arg Glu Asp Ser	Ala Pro Glu Gly Glu Lys	Arg Val Glu
325	330	335
Leu His Leu His Ser Pro Met	Ser Gln Met Asp Ala Val	Thr Gly Ile
340	345	350
Gly Lys Leu Val Glu Gln Ala	Lys Lys Trp Gly His Glu	Ala Ile Ala
355	360	365
Leu Thr Asp His Ala Val	Val Gln Ser Phe Pro Asp	Ala Tyr Ser Ala
370	375	380
Ala Lys Lys His Gly Ile	Lys Met Ile Tyr Gly Met	Glu Ala Asn Leu
385	390	395 400
Val Asp Asp Gly Val Pro	Ile Ala Tyr Asn Ala Ala	His Arg Leu Leu
405	410	415
Glu Glu Glu Thr Tyr Val	Val Phe Asp Val Glu Thr	Thr Gly Leu Ser
420	425	430
Ala Val Tyr Asp Thr Ile	Ile Glu Leu Ala Ala Val	Lys Val Lys Gly
435	440	445
Gly Glu Ile Ile Asp Lys	Phe Glu Ala Phe Ala Asn	Pro His Arg Pro
450	455	460
Leu Ser Ala Thr Ile Ile	Glu Leu Thr Gly Ile Thr	Asp Asp Met Leu
465	470	475 480

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Gln Asp Ala Pro Asp Val Val Asp Val Ile Arg Asp Phe Arg Glu Trp
485 490 495

Ile Gly Asp Asp Ile Leu Val Ala His Asn Ala Ser Phe Asp Met Gly
500 505 510

Phe Leu Asn Val Ala Tyr Lys Lys Leu Leu Glu Val Glu Lys Ala Lys
515 520 525

Asn Pro Val Ile Asp Thr Leu Glu Leu Gly Arg Phe Leu Tyr Pro Glu
530 535 540

Phe Lys Asn His Arg Leu Asn Thr Leu Cys Lys Lys Phe Asp Ile Glu
545 550 555 560

Leu Thr Gln His His Arg Ala Ile Tyr Asp Thr Glu Ala Thr Ala Tyr
565 570 575

Leu Leu Leu Lys Met Leu Lys Asp Ala Ala Glu Lys Gly Ile Gln Tyr
580 585 590

His Asp Glu Leu Asn Glu Asn Met Gly Gln Ser Asn Ala Tyr Gln Arg
595 600 605

Ser Arg Pro Tyr His Ala Thr Leu Leu Ala Val Asn Ser Thr Gly Leu
610 615 620

Lys Asn Leu Phe Lys Leu Val Ser Leu Ser His Ile His Tyr Phe Tyr
625 630 635 640

Arg Val Pro Arg Ile Pro Arg Ser Gln Leu Glu Lys Tyr Arg Glu Gly
645 650 655

Leu Leu Ile Gly Ser Ala Cys Asp Arg Gly Glu Val Phe Glu Gly Met
660 665 670

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Met Glu Lys Ser Pro Glu Glu Val Glu Asp Ile Ala Ser Phe Tyr Asp
675 680 685

Tyr Leu Glu Val Gln Pro Pro Glu Val Tyr Arg His Leu Leu Glu Leu
690 695 700

Glu Leu Val Arg Asp Glu Lys Ala Leu Lys Glu Ile Ile Ala Asn Ile
705 710 715 720

Thr Lys Leu Gly Glu Lys Leu Asn Lys Pro Val Val Ala Thr Gly Asn
725 730 735

Val His Tyr Leu Asn Asp Glu Asp Lys Ile Tyr Arg Lys Ile Leu Ile
740 745 750

Ser Ser Gln Gly Gly Ala Asn Pro Leu Asn Arg His Glu Leu Pro Lys
755 760 765

Val His Phe Arg Thr Thr Asp Glu Met Leu Glu Ala Phe Ser Phe Leu
770 775 780

Gly Glu Glu Lys Ala Lys Glu Ile Val Val Thr Asn Thr Gln Lys Val
785 790 795 800

Ala Ser Leu Val Asp Asp Ile Lys Pro Ile Lys Asp Asp Leu Tyr Thr
805 810 815

Pro Lys Ile Glu Gly Ala Asp Glu Glu Ile Arg Glu Met Ser Tyr Gln
820 825 830

Arg Ala Arg Ser Ile Tyr Gly Glu Glu Leu Pro Glu Ile Val Glu Ala
835 840 845

Arg Ile Glu Lys Glu Leu Lys Ser Ile Ile Gly His Gly Phe Ala Val
850 855 860

Ile Tyr Leu Ile Ser His Lys Leu Val Lys Arg Ser Leu Asp Asp Gly

44/236

865	870	875	880
Tyr Leu Val Gly Ser Arg Gly Ser Val Gly Ser Ser Leu Val Ala Thr			
885	890	895	
Leu Thr Glu Ile Thr Glu Val Asn Pro Leu Pro Pro His Tyr Val Cys			
900	905	910	
Pro Glu Cys Gln His Ser Glu Phe Phe Asn Asp Gly Ser Val Gly Ser			
915	920	925	
Gly Phe Asp Leu Pro Asp Lys Thr Cys Pro His Cys Gly Thr Pro Leu			
930	935	940	
Lys Lys Asp Gly His Asp Ile Pro Phe Glu Thr Phe Leu Gly Phe Lys			
945	950	955	960
Gly Asp Lys Val Pro Asp Ile Asp Leu Asn Phe Ser Gly Glu Tyr Gln			
965	970	975	
Pro Gln Ala His Asn Tyr Thr Lys Val Leu Phe Gly Glu Asp Asn Val			
980	985	990	
Tyr Arg Ala Gly Thr Ile Gly Thr Val Ala Glu Lys Thr Ala Tyr Gly			
995	1000	1005	
Tyr Val Lys Gly Tyr Ala Gly Asp Asn Asn Leu His Met Arg Gly Ala			
1010	1015	1020	
Glu Ile Asp Arg Leu Val Gln Gly Cys Thr Gly Val Lys Arg Thr Thr			
1025	1030	1035	1040
Gly Gln His Pro Gly Gly Ile Ile Val Val Pro Asp Tyr Met Asp Ile			
1045	1050	1055	
Tyr Asp Phe Ser Pro Ile Gln Phe Pro Ala Asp Ala Thr Gly Ser Glu			
1060	1065	1070	

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Trp Lys Thr Thr His Phe Asp Phe His Ser Ile His Asp Asn Leu Leu
1075 1080 1085

Lys Leu Asp Ile Leu Gly His Asp Asp Pro Thr Val Ile Arg Met Leu
1090 1095 1100

Gln Asp Leu Ser Gly Ile Asp Pro Lys Thr Ile Pro Thr Asp Asp Pro
1105 1110 1115 1120

Glu Val Met Lys Ile Phe Gln Gly Thr Glu Ser Leu Gly Val Thr Glu
1125 1130 1135

Glu Gln Ile Gly Cys Lys Thr Gly Thr Leu Gly Ile Pro Glu Phe Gly
1140 1145 1150

Thr Arg Phe Val Arg Gln Met Leu Glu Asp Thr Lys Pro Thr Thr Phe
1155 1160 1165

Ser Glu Leu Val Gln Ile Ser Gly Leu Ser His Gly Thr Asp Val Trp
1170 1175 1180

Leu Gly Asn Ala Gln Glu Leu Ile His Asn Asn Ile Cys Glu Leu Ser
1185 1190 1195 1200

Glu Val Ile Gly Cys Arg Asp Asp Ile Met Val Tyr Leu Ile Tyr Gln
1205 1210 1215

Gly Leu Glu Pro Ser Leu Ala Phe Lys Ile Met Glu Phe Val Arg Lys
1220 1225 1230

Gly Lys Gly Leu Thr Pro Glu Trp Glu Glu Glu Met Lys Asn Asn Asn
1235 1240 1245

Val Pro Asp Trp Tyr Ile Asp Ser Cys Lys Lys Ile Lys Tyr Met Phe
1250 1255 1260

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Pro Lys Ala His Ala Ala Ala Tyr Val Leu Met Ala Val Arg Ile Ala
1285 1270 1275 1280

Tyr Phe Lys Val His His Ala Leu Leu Tyr Tyr Ala Ala Tyr Phe Thr
1285 1290 1295

Val Arg Ala Asp Asp Phe Asp Ile Asp Thr Met Ile Lys Gly Ser Thr
1300 1305 1310

Ala Ile Arg Ala Val Met Glu Asp Ile Asn Ala Lys Gly Leu Asp Ala
1315 1320 1325

Ser Pro Lys Glu Lys Asn Leu Leu Thr Val Leu Glu Leu Ala Leu Glu
1330 1335 1340

Met Cys Glu Arg Gly Tyr Ser Phe Gln Lys Val Asp Leu Tyr Arg Ser
1345 1350 1355 1360

Ser Ala Thr Glu Phe Ile Ile Asp Gly Asn Ser Leu Ile Pro Pro Phe
1365 1370 1375

Asn Ser Ile Pro Gly Leu Gly Thr Asn Ala Ala Leu Asn Ile Val Lys
1380 1385 1390

Ala Arg Glu Glu Gly Glu Phe Leu Ser Lys Glu Asp Leu Gln Lys Arg
1395 1400 1405

Gly Lys Val Ser Lys Thr Ile Leu Glu Tyr Leu Asp Arg His Gly Cys
1410 1415 1420

Leu Glu Ser Leu Pro Asp Gln Asn Gln Leu Ser Leu Phe
1425 1430 1435

<210> 45

<211> 1081

47/236

<212> PRT

<213> *Arabidopsis thaliana*

<400> 45

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Pro Pro Pro Ala Gly Lys His Arg Ala Thr Gly Asp Ser Thr Pro Ser
20 25 30

Pro Ala Ile Gly Thr Leu Asp Asp Glu Phe Met Met Glu Glu Asp Val
35 40 45

Phe Leu Asp Glu Thr Leu Leu Tyr Gly Asp Glu Asp Glu Glu Ser Leu
50 55 60

Ile Leu Arg Asp Ile Glu Glu Arg Glu Ser Arg Ser Ser Ala Trp Ala
65 70 75 80

Arg Pro Pro Leu Ser Pro Ala Tyr Leu Ser Asn Ser Gln Ile Phe Gln
85 90 95

Gln Leu Glu Ile Asp Ser Ile Ile Ala Glu Ser His Lys Glu Leu Leu
100 105 110

Pro Gly Ser Ser Gly Gln Ala Pro Ile Ile Arg Met Phe Gly Val Thr
115 120 125

Arg Glu Gly Asn Ser Val Cys Cys Phe Val His Gly Phe Glu Pro Tyr
130 135 140

Phe Tyr Ile Ala Cys Pro Pro Gly Met Gly Pro Asp Asp Ile Ser Asn
145 150 155 160

Phe His Gln Ser Leu Glu Gly Arg Met Arg Glu Ser Asn Lys Asn Ala
165 170 175

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Lys Val Pro Lys Phe Val Lys Arg Ile Glu Met Val Gln Lys Arg Ser			
180	185	190	
Ile Met Tyr Tyr Gln Gln Gln Lys Ser Gln Thr Phe Leu Lys Ile Thr			
195	200	205	
Val Ala Leu Pro Thr Met Val Ala Ser Cys Arg Gly Ile Leu Asp Arg			
210	215	220	
Gly Leu Gln Ile Asp Gly Leu Gly Met Lys Ser Phe Gln Thr Tyr Glu			
225	230	235	240
Ser Asn Ile Leu Phe Val Leu Arg Phe Met Val Asp Cys Asp Ile Val			
245	250	255	
Gly Gly Asn Trp Ile Glu Val Pro Thr Gly Lys Tyr Lys Lys Asn Ala			
260	265	270	
Arg Thr Leu Ser Tyr Cys Gln Leu Glu Phe His Cys Leu Tyr Ser Asp			
275	280	285	
Leu Ile Ser His Ala Ala Glu Gly Glu Tyr Ser Lys Met Ala Pro Phe			
290	295	300	
Arg Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys Gly His Phe			
305	310	315	320
Pro Glu Ala Lys His Asp Pro Val Ile Gln Ile Ala Asn Leu Val Thr			
325	330	335	
Leu Gln Gly Glu Asp His Pro Phe Val Arg Asn Val Met Thr Leu Lys			
340	345	350	
Ser Cys Ala Pro Ile Val Gly Val Asp Val Met Ser Phe Glu Thr Glu			
355	360	365	

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Arg Glu Val Leu Leu Ala Trp Arg Asp Leu Ile Arg Asp Val Asp Pro
370 375 380

Asp Ile Ile Ile Gly Tyr Asn Ile Cys Lys Phe Asp Leu Pro Tyr Leu
385 390 395 400

Ile Glu Arg Ala Ala Thr Leu Gly Ile Glu Glu Phe Pro Leu Leu Gly
405 410 415

Arg Val Lys Asn Ser Arg Val Arg Val Arg Asp Ser Thr Phe Ser Ser
420 425 430

Arg Gln Gln Gly Ile Arg Glu Ser Lys Glu Thr Thr Ile Glu Gly Arg
435 440 445

Phe Gln Phe Asp Leu Ile Gln Ala Ile His Arg Asp His Lys Leu Ser
450 455 460

Ser Tyr Ser Leu Asn Ser Val Ser Ala His Phe Leu Ser Glu Gln Lys
465 470 475 480

Glu Asp Val His His Ser Ile Ile Thr Asp Leu Gln Asn Gly Asn Ala
485 490 495

Glu Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu Lys Asp Ala Tyr Leu
500 505 510

Pro Gln Arg Leu Leu Asp Lys Leu Met Phe Ile Tyr Asn Tyr Val Glu
515 520 525

Met Ala Arg Val Thr Gly Val Pro Ile Ser Phe Leu Leu Ala Arg Gly
530 535 540

Gln Ser Ile Lys Val Leu Ser Gln Leu Leu Arg Lys Gly Lys Gln Lys
545 550 555 560

Asn Leu Val Leu Pro Asn Ala Lys Gln Ser Gly Ser Glu Gln Gly Thr

50/236

565	570	575
Tyr Glu Gly Ala Thr Val	Leu Glu Ala Arg Thr Gly Phe Tyr Glu Lys	
580	585	590
Pro Ile Ala Thr Leu Asp Phe Ala Ser Leu Tyr Pro Ser Ile Met Met		
595	600	605
Ala Tyr Asn Leu Cys Tyr Cys Thr Leu Val Thr Pro Glu Asp Val Arg		
610	615	620
Lys Leu Asn Leu Pro Pro Glu His Val Thr Lys Thr Pro Ser Gly Glu		
625	630	635 640
Thr Phe Val Lys Gln Thr Leu Gln Lys Gly Ile Leu Pro Glu Ile Leu		
645	650	655
Glu Glu Leu Leu Thr Ala Arg Lys Arg Ala Lys Ala Asp Leu Lys Glu		
660	665	670
Ala Lys Asp Pro Leu Glu Lys Ala Val Leu Asp Gly Arg Gln Leu Ala		
675	680	685
Leu Lys Ile Ser Ala Asn Ser Val Tyr Gly Phe Thr Gly Ala Thr Val		
690	695	700
Gly Gln Leu Pro Cys Leu Glu Ile Ser Ser Ser Val Thr Ser Tyr Gly		
705	710	715 720
Arg Gln Met Ile Glu Gln Thr Lys Lys Leu Val Glu Asp Lys Phe Thr		
725	730	735
Thr Leu Gly Gly Tyr Gln Tyr Asn Ala Glu Val Ile Tyr Gly Asp Thr		
740	745	750
Asp Ser Val Met Val Gln Phe Gly Val Ser Asp Val Glu Ala Ala Met		

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755	760	765
Thr Leu Gly Arg Glu Ala Ala Glu His Ile Ser Gly Thr Phe Ile Lys		
770	775	780
Pro Ile Lys Leu Glu Phe Glu Lys Val Tyr Phe Pro Tyr Leu Leu Ile		
785	790	795 800
Asn Lys Lys Arg Tyr Ala Gly Leu Leu Trp Thr Asn Pro Gln Gln Phe		
805	810	815
Asp Lys Met Asp Thr Lys Gly Ile Glu Thr Val Arg Arg Asp Asn Cys		
820	825	830
Leu Leu Val Lys Asn Leu Val Thr Glu Ser Leu Asn Lys Ile Leu Ile		
835	840	845
Asp Arg Asp Val Pro Gly Ala Ala Glu Asn Val Lys Lys Thr Ile Ser		
850	855	860
Asp Leu Leu Met Asn Arg Ile Asp Leu Ser Leu Leu Val Ile Thr Lys		
865	870	875 880
Gly Leu Thr Lys Thr Gly Asp Asp Tyr Glu Val Lys Ser Ala His Gly		
885	890	895
Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Ala Ala Thr Ala Pro Asn		
900	905	910
Val Gly Asp Arg Val Pro Tyr Val Ile Ile Lys Ala Ala Lys Gly Ala		
915	920	925
Lys Ala Tyr Glu Arg Ser Glu Asp Pro Ile Tyr Val Leu Gln Asn Asn		
930	935	940
Ile Pro Ile Asp Pro Asn Tyr Tyr Leu Glu Asn Gln Ile Ser Lys Pro		
945	950	955 960

52/236

Leu Leu Arg Ile Phe Glu Pro Val Leu Lys Asn Ala Ser Lys Glu Leu
 965 970 975

Leu His Gly Ser His Thr Arg Ser Ile Ser Ile Thr Thr Pro Ser Asn
 980 985 990

Ser Gly Ile Met Lys Phe Ala Lys Lys Gln Leu Ser Cys Val Gly Cys
 995 1000 1005

Lys Val Pro Ile Arg Tyr Phe Val Gln Trp Asn Thr Met Arg Lys Leu
 1010 1015 1020

Gln Gly Lys Arg Ser Arg Val Ile Leu Gln Lys Arg Val Ser Arg Tyr
 1025 1030 1035 1040

Ala Ala Trp Leu Ser Leu Lys Arg Phe Leu Gly Gly Cys Gly His Ser
 1045 1050 1055

Ala Arg Ser Val Lys Ala Leu Phe Ile Lys Met Ser Cys Ala Pro Val
 1060 1065 1070

Glu Ile Val Gln Tyr Phe Thr Gly Glu
 1075 1080

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<211> 2154

<212> PRT

<213> Arabidopsis thaliana

<400> 46

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Ala Ala Asp Glu Leu Glu Thr Lys Leu Gly Phe Gly Leu Phe Ser Gln
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Gly Glu Thr Arg Leu Gly Trp Leu Leu Thr Phe Ala Ser Ser Ser Trp
35 40 45

Glu Asp Ala Asp Thr Gly Lys Thr Phe Ser Cys Val Asp Leu Phe Phe
50 55 60

Val Thr Gln Asp Gly Ser Ser Phe Lys Thr Lys Tyr Lys Phe Arg Pro
65 70 75 80

Tyr Leu Tyr Ala Ala Thr Lys Asp Asn Met Glu Leu Glu Val Glu Ala
85 90 95

Tyr Leu Arg Arg Arg Tyr Glu Arg Gln Val Ala Asp Ile Gln Ile Val
100 105 110

His Lys Glu Asp Leu Tyr Leu Lys Asn His Leu Ser Gly Leu Gln Lys
115 120 125

Lys Tyr Leu Lys Val Ser Phe Asp Thr Val Gln Gln Leu Val Glu Val
130 135 140

Lys Arg Asp Leu Leu His Ile Val Glu Arg Asn Leu Ala Lys Phe Asn
145 150 155 160

Ala Leu Glu Ala Tyr Glu Ser Ile Leu Ser Gly Lys Arg Glu Gln Arg
165 170 175

Pro Gln Asp Cys Leu Asp Ser Val Val Asp Leu Arg Glu Tyr Asp Val
180 185 190

Pro Tyr His Val Arg Phe Ala Ile Asp Asn Asp Val Arg Ser Gly Gln
195 200 205

Trp Tyr Asn Val Ser Ile Ser Ser Thr Asp Val Ile Leu Glu Lys Arg
210 215 220

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Thr Asp Leu Leu Gln Arg Ala Glu Val Arg Val Cys Ala Phe Asp Ile
225 230 235 240

Glu Thr Val Lys Leu Pro Leu Lys Phe Pro Asp Ala Glu Tyr Asp Gln
245 250 255

Ile Met Met Ile Ser Tyr Met Val Asp Gly Gln Gly Phe Leu Ile Thr
260 265 270

Asn Arg Glu Cys Val Gly Lys Asp Ile Glu Asp Leu Glu Tyr Thr Pro
275 280 285

Lys Pro Glu Phe Glu Gly Tyr Phe Lys Val Thr Asn Val Thr Asn Glu
290 295 300

Val Glu Leu Leu Arg Lys Trp Phe Ser His Met Gln Glu Leu Lys Pro
305 310 315 320

Gly Ile Tyr Val Thr Tyr Asn Gly Asp Phe Phe Asp Trp Pro Phe Ile
325 330 335

Glu Arg Arg Ala Ser His His Gly Ile Lys Met Asn Glu Glu Leu Gly
340 345 350

Phe Arg Cys Asp Gln Asn Gln Gly Glu Cys Arg Ala Lys Phe Val Cys
355 360 365

His Leu Asp Cys Phe Ser Trp Val Lys Arg Asp Ser Tyr Leu Pro Gln
370 375 380

Gly Ser Gln Gly Leu Lys Ala Val Thr Lys Val Lys Leu Gly Tyr Asp
385 390 395 400

Pro Leu Glu Val Asn Pro Glu Asp Met Val Arg Phe Ala Met Glu Lys
405 410 415

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Pro Gln Thr Met Ala Ser Tyr Ser Val Ser Asp Ala Val Ala Thr Tyr
420 425 430

Tyr Leu Tyr Met Thr Tyr Val His Pro Phe Val Phe Ser Leu Ala Thr
435 440 445

Ile Ile Pro Met Val Pro Asp Glu Val Leu Arg Lys Gly Ser Gly Thr
450 455 460

Leu Cys Glu Met Leu Leu Met Val Glu Ala Tyr Lys Ala Asn Val Val
465 470 475 480

Cys Pro Asn Lys Asn Gln Ala Asp Pro Glu Lys Phe Tyr Gln Gly Lys
485 490 495

Leu Leu Glu Ser Glu Thr Tyr Ile Gly Gly His Val Glu Cys Leu Gln
500 505 510

Ser Gly Val Phe Arg Ser Asp Ile Pro Thr Ser Phe Lys Leu Asp Ala
515 520 525

Ser Ala Tyr Gln Gln Leu Ile Asp Asn Leu Gly Arg Asp Leu Glu Tyr
530 535 540

Ala Ile Thr Val Glu Gly Lys Met Arg Met Asp Ser Val Ser Asn Phe
545 550 555 560

Asp Glu Val Lys Glu Val Ile Arg Glu Lys Leu Glu Lys Leu Arg Asp
565 570 575

Asp Pro Ile Arg Glu Glu Gly Pro Leu Ile Tyr His Leu Asp Val Ala
580 585 590

Ala Met Tyr Pro Asn Ile Ile Leu Thr Asn Arg Leu Gln Pro Pro Ser
595 600 605

Ile Val Thr Asp Glu Val Cys Thr Ala Cys Asp Phe Asn Gly Pro Glu

56/236

610	615	620
Lys Thr Cys Leu Arg Lys Leu Glu Trp Val Trp Arg Gly Val Thr Phe		
625	630	635 640
Lys Gly Asn Lys Ser Glu Tyr Tyr His Leu Lys Lys Gln Ile Glu Ser		
	645	650 655
Glu Ser Val Asp Ala Gly Ala Asn Met Gln Ser Ser Lys Pro Phe Leu		
	660	665 670
Asp Leu Pro Lys Val Glu Gln Gln Ser Lys Leu Lys Glu Arg Leu Lys		
	675	680 685
Lys Tyr Cys Gln Lys Ala Tyr Ser Arg Val Leu Asp Lys Pro Ile Thr		
690	695	700
Glu Val Arg Glu Ala Gly Ile Cys Met Arg Glu Asn Pro Phe Tyr Val		
705	710	715 720
Asp Thr Val Arg Ser Phe Arg Asp Arg Arg Tyr Glu Tyr Lys Thr Leu		
	725	730 735
Asn Lys Val Trp Lys Gly Lys Leu Ser Glu Ala Lys Ala Ser Gly Asn		
	740	745 750
Leu Ile Lys Ile Gln Glu Ala His Asp Met Val Val Val Tyr Asp Ser		
	755	760 765
Leu Gln Leu Ala His Lys Cys Ile Leu Asn Ser Phe Tyr Gly Tyr Val		
770	775	780
Met Arg Lys Gly Ala Arg Trp Tyr Ser Met Glu Met Ala Gly Val Val		
785	790	795 800
Thr Tyr Thr Gly Ala Lys Ile Ile Gln Asn Ala Arg Leu Leu Ile Glu		
	805	810 815

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Arg Ile Gly Lys Pro Leu Glu Leu Asp Thr Asp Gly Ile Trp Cys Ala
820 825 830

Leu Pro Gly Ser Phe Pro Glu Asn Phe Thr Phe Lys Thr Ile Asp Met
835 840 845

Lys Lys Phe Thr Ile Ser Tyr Pro Cys Val Ile Leu Asn Val Asp Val
850 855 860

Ala Lys Asn Asn Ser Asn Asp Gln Tyr Gln Thr Leu Val Asp Pro Val
865 870 875 880

Arg Lys Thr Tyr Asn Ser Arg Ser Glu Cys Ser Ile Glu Phe Glu Val
885 890 895

Asp Gly Pro Tyr Lys Ala Met Ile Ile Pro Ala Ser Lys Glu Glu Gly
900 905 910

Ile Leu Ile Lys Lys Arg Tyr Ala Val Phe Asn His Asp Gly Thr Ile
915 920 925

Ala Glu Leu Lys Gly Phe Glu Met Lys Arg Arg Gly Glu Leu Lys Leu
930 935 940

Ile Lys Val Phe Gln Ala Glu Leu Phe Asp Lys Phe Leu His Gly Ser
945 950 955 960

Thr Leu Glu Glu Cys Tyr Ser Ala Val Ala Ala Val Ala Asn Arg Trp
965 970 975

Leu Asp Leu Leu Glu Gly Gln Gly Lys Asp Ile Ala Asp Ser Glu Leu
980 985 990

Leu Asp Tyr Ile Ser Glu Ser Ser Thr Met Ser Lys Ser Leu Ala Asp
995 1000 1005

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Tyr Gly Gln Gln Lys Ser Cys Ala Val Thr Thr Ala Lys Arg Leu Ala
1010 1015 1020

Asp Phe Leu Gly Asp Thr Met Val Lys Asp Lys Gly Leu Arg Cys Gln
1025 1030 1035 1040

Tyr Ile Val Ala Arg Glu Pro Glu Gly Thr Pro Val Ser Glu Arg Ala
1045 1050 1055

Val Pro Val Ala Ile Phe Gln Thr Asp Asp Pro Glu Lys Lys Phe Tyr
1060 1065 1070

Leu Gln Lys Trp Cys Lys Ile Ser Ser Tyr Thr Gly Ile Arg Ser Ile
1075 1080 1085

Ile Asp Trp Met Tyr Tyr Lys Gln Arg Leu His Ser Ala Ile Gln Lys
1090 1095 1100

Val Ile Thr Ile Pro Ala Ala Met Gln Lys Val Ala Asn Pro Val Leu
1105 1110 1115 1120

Arg Val Arg His Pro Tyr Trp Leu Glu Lys Lys Val Cys Asp Lys Phe
1125 1130 1135

Arg Gln Gly Lys Ile Val Asp Met Phe Ser Ser Ala Asn Lys Asp His
1140 1145 1150

Ser Thr Thr Gln Asp Asn Val Val Ala Asp Ile Glu Glu Phe Cys Lys
1155 1160 1165

Glu Asn Arg Pro Ser Val Lys Gly Pro Lys Pro Val Ala Arg Ser Phe
1170 1175 1180

Glu Val Asp Arg Asn His Ser Glu Gly Lys Gln Gln Glu Ser Trp Asp
1185 1190 1195 1200

Pro Glu Phe His Asp Ile Ser Leu Gln Asn Val Asp Lys Asn Val Asp

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1205	1210	1215
Tyr Gln Gly Trp Leu Glu Leu Glu Lys Arg Lys Trp Lys Met Thr Leu		
1220	1225	1230
Thr Asn Lys Lys Lys Arg Arg Phe Asp Asp Leu Lys Pro Cys Asn Gln		
1235	1240	1245
Ile Asp Ala His Lys Ile Asn Lys Lys Val Cys Lys Gly Arg Val Gly		
1250	1255	1260
Val Gly Ser Tyr Phe Arg Arg Pro Glu Glu Ala Leu Thr Ser Ser Tyr		
1265	1270	1275
1280		
Leu Gln Ile Ile Gln Leu Val Gln Ser Pro Gln Ser Gly Gln Phe Phe		
1285	1290	1295
Ala Trp Val Val Val Glu Gly Leu Met Leu Lys Ile Pro Leu Thr Ile		
1300	1305	1310
Pro Arg Val Phe Tyr Ile Asn Ser Lys Ala Ser Ile Ala Gly Asn Phe		
1315	1320	1325
Thr Gly Lys Cys Ile Asn Lys Ile Leu Pro His Gly Lys Pro Cys Tyr		
1330	1335	1340
Asn Leu Met Glu Ala Arg His Leu His Asn Thr His Ile Leu Leu Leu		
1345	1350	1355
1360		
Val Asn Ile Gln Glu Asp Gln Phe Ile Lys Glu Ser Lys Lys Leu Ala		
1365	1370	1375
Ala Leu Leu Ala Asp Pro Glu Ile Glu Gly Ile Tyr Glu Thr Lys Met		
1380	1385	1390
Pro Leu Glu Phe Ser Ala Ile Cys Gln Ile Gly Cys Val Cys Lys Ile		
1395	1400	1405

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Glu Asp Thr Ala Lys His Arg Asn Thr Gln Asp Gly Trp Lys Leu Gly
1410 1415 1420

Glu Leu His Arg Ile Thr Thr Thr Glu Cys Arg Tyr Leu Glu Asn Ser
1425 1430 1435 1440

Ile Pro Leu Val Tyr Leu Tyr His Ser Thr Ser Thr Gly Arg Ala Val
1445 1450 1455

Tyr Val Leu Tyr Cys His Ala Ser Lys Leu Met Ser Val Val Val Val
1460 1465 1470

Asn Pro Tyr Gly Asp Lys Glu Leu Leu Ser Ser Ala Leu Glu Arg Gln
1475 1480 1485

Phe Arg Asp Arg Cys Gln Glu Leu Ser Pro Glu Pro Phe Ser Trp Asp
1490 1495 1500

Gly Ile Leu Phe Gln Val Glu Tyr Val Asp His Pro Glu Ala Ala Thr
1505 1510 1515 1520

Lys Phe Leu Gln Lys Ala Leu Cys Glu Tyr Arg Glu Glu Asn Cys Gly
1525 1530 1535

Ala Thr Val Ala Val Ile Glu Cys Pro Asp Phe Asn Thr Thr Lys Glu
1540 1545 1550

Gly Val Lys Ala Leu Glu Asp Phe Pro Cys Val Arg Ile Pro Phe Asn
1555 1560 1565

Asp Asp Asp Asn Ser Tyr Gln Pro Val Ser Trp Gln Arg Pro Ala Ala
1570 1575 1580

Lys Ile Ala Val Leu Arg Cys Ala Ser Ala Ile Gln Trp Leu Asp Arg
1585 1590 1595 1600

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Arg Ile Ala Gln Ser Arg Tyr Ala His Val Pro Leu Gly Asn Phe Gly
1605 1610 1615

Arg Asp Trp Leu Thr Phe Thr Val Asp Ile Phe Leu Ser Arg Ala Leu
1620 1625 1630

Arg Asp Gln Gln Gln Val Leu Trp Val Ser Asp Asn Gly Val Pro Asp
1635 1640 1645

Leu Gly Asp Ile Asn Asn Glu Glu Thr Phe Leu Ala Asp Glu Leu Gln
1650 1655 1660

Glu Thr Ser Leu Leu Phe Pro Gly Ala Tyr Arg Lys Val Ser Val Glu
1665 1670 1675 1680

Leu Lys Val His Arg Leu Ala Val Asn Ala Leu Leu Lys Ser Asp Leu
1685 1690 1696

Val Ser Glu Met Glu Gly Gly Gly Phe Leu Gly Val Asn Ser Arg Gly
1700 1705 1710

Ser Ser Leu Asn Asp Asn Gly Ser Phe Asp Glu Asn Asn Gly Cys Ala
1715 1720 1725

Gln Ala Phe Arg Val Leu Lys Gln Leu Ile Lys Arg Leu Leu His Asp
1730 1735 1740

Ala Cys Asn Ser Gly Asn Ile Tyr Ala Asp Ser Ile Leu Gln His Leu
1745 1750 1755 1760

Ser Trp Trp Leu Arg Ser Pro Ser Ser Lys Leu His Asp Pro Ala Leu
1765 1770 1775

His Leu Met Leu His Lys Val Met Gln Lys Val Phe Ala Leu Leu Leu
1780 1785 1790

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Thr Asp Leu Arg Arg Leu Gly Ala Ile Ile Ile Tyr Ala Asp Phe Ser
1795 1800 1805

Lys Val Ile Ile Asp Thr Gly Lys Phe Asp Leu Ser Ala Ala Lys Thr
1810 1815 1820

Tyr Cys Glu Ser Leu Leu Thr Val Met Gly Ser Arg Asp Ile Phe Lys
1825 1830 1835 1840

Leu Ile Leu Leu Glu Pro Val His Tyr Trp His Ser Leu Leu Phe Met
1845 1850 1855

Asp Gln His Asn Tyr Ala Gly Ile Arg Ala Thr Gly Asp Glu Ile Ser
1860 1865 1870

Gly Asn Glu Val Thr Ile Glu Pro Lys Trp Ser Val Ala Arg His Leu
1875 1880 1885

Pro Glu Tyr Ile Gln Lys Asp Phe Ile Ile Ile Val Ala Thr Phe Ile
1890 1895 1900

Phe Gly Pro Trp Lys Phe Ala Leu Glu Lys Lys Arg Gly Ser Ala Glu
1905 1910 1915 1920

Ser Leu Glu Ala Glu Met Val Glu Tyr Leu Lys Glu Gln Ile Gly Thr
1925 1930 1935

Arg Phe Ile Ser Met Ile Val Glu Lys Ile Gly Asn Ile Arg Ser His
1940 1945 1950

Ile Lys Asp Ile Asn Val Ser Asp Ala Ser Trp Ala Ser Gly Gln Ala
1955 1960 1965

Pro Lys Gly Asp Tyr Thr Phe Glu Phe Ile Gln Ile Ile Thr Ala Val
1970 1975 1980

Leu Ala Leu Asp Gln Asn Val Gln Gln Asp Val Leu Val Met Arg Lys

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1985	1990	1995	2000
Ile Leu Leu Lys Tyr Ile Lys Val Lys Glu Cys Ala Ala Glu Ala Glu			
2005	2010	2015	
Phe Ile Asp Pro Gly Pro Ser Phe Ile Leu Pro Asn Val Ala Cys Ser			
2020	2025	2030	
Asn Cys Gly Ala Tyr Arg Asp Leu Asp Phe Cys Arg Asp Ser Ala Leu			
2035	2040	2045	
Leu Thr Glu Lys Glu Trp Ser Cys Ala Asp Pro Gln Cys Val Lys Ile			
2050	2055	2060	
Tyr Asp Lys Glu Gln Ile Glu Ser Ser Ile Ile Gln Met Val Arg Gln			
2065	2070	2075	2080
Arg Glu Arg Met Tyr Gln Leu Gln Asp Leu Val Cys Asn Arg Cys Asn			
2085	2090	2095	
Gln Val Lys Ala Ala His Leu Thr Glu Gln Cys Glu Cys Ser Gly Ser			
2100	2105	2110	
Phe Arg Cys Lys Glu Ser Gly Ser Asp Phe His Lys Arg Ile Glu Ile			
2115	2120	2125	
Phe Leu Asp Ile Ala Lys Arg Gln Lys Phe Arg Leu Leu Glu Glu Cys			
2130	2135	2140	
Ile Ser Trp Ile Leu Phe Ala Thr Ser Cys			
2145	2150		

<210> 47

<211> 3708

<212> DNA

<213> *Oryza sativa*

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<400> 47

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gattgagggt gagaagcacc cattcaagaa aaaaaaaaaa aaaaaa 3706

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<210> 48

<211> 1106

<212> PRT

<213> Oryza sativa

<400> 48

Met Ser Ser Gly Gly Arg Gly Gly Lys Arg Arg Gly Ala Pro Pro Pro

1

5

10

15

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Gly Pro Ser Gly Ala Ala Ala Lys Arg Ala His Pro Gly Gly Thr Pro
20 25 30

Gln Pro Pro Pro Pro Ala Ala Thr Ala Ala Ala Pro Val Ala Glu Glu
35 40 45

Glu Asp Met Met Asp Glu Asp Val Phe Leu Asp Glu Thr Ile Leu Ala
50 55 60

Glu Asp Glu Glu Ala Leu Leu Leu Leu Asp Arg Asp Glu Ala Leu Ala
65 70 75 80

Ser Arg Leu Ser Arg Trp Arg Arg Pro Ala Leu Pro Ala Asp Leu Ala
85 90 95

Ser Gly Cys Ser Arg Asn Val Ala Phe Gln Gln Leu Glu Ile Asp Tyr
100 105 110

Val Ile Gly Glu Ser His Lys Val Leu Leu Pro Asn Ser Ser Gly Pro
115 120 125

Ala Ala Ile Leu Arg Ile Phe Gly Val Thr Arg Glu Gly His Ser Val
130 135 140

Cys Cys Gln Val His Gly Phe Glu Pro Tyr Phe Tyr Ile Ser Cys Pro
145 150 155 160

Met Gly Met Gly Pro Asp Asp Ile Ser Arg Phe His Gln Thr Leu Glu
165 170 175

Gly Arg Met Lys Asp Ser Asn Arg Asn Ser Asn Val Pro Arg Phe Val
180 185 190

Lys Arg Ile Glu Leu Val Gln Lys Gln Thr Ile Met His Tyr Gln Pro
195 200 205

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Gln Gln Ser Gln Pro Phe Leu Lys Ile Val Val Ala Leu Pro Thr Met
210 215 220

Val Ala Ser Cys Arg Gly Ile Leu Glu Arg Gly Ile Thr Ile Glu Gly
225 230 235 240

Leu Gly Ser Lys Ser Phe Leu Thr Tyr Glu Ser Asn Ile Leu Phe Ala
245 250 255

Leu Arg Phe Met Ile Asp Cys Asn Ile Val Gly Gly Asn Trp Ile Glu
260 265 270

Val Pro Ala Gly Lys Tyr Met Lys Ala Ala Arg Ile Met Ser Tyr Cys
275 280 285

Gln Leu Glu Leu Asp Cys Leu Tyr Ser Asp Leu Val Ser His Ala Ala
290 295 300

Glu Gly Glu His Ser Lys Met Ala Pro Phe Arg Ile Leu Ser Phe Asp
305 310 315 320

Ile Glu Cys Ala Gly Arg Lys Gly His Phe Pro Glu Pro Thr His Asp
325 330 335

Pro Val Ile Gln Ile Ala Asn Leu Val Thr Leu Gln Gly Glu Gly Gln
340 345 350

Pro Phe Val Arg Asn Val Met Thr Leu Lys Ser Cys Ser Pro Ile Val
355 360 365

Gly Val Asp Val Met Ser Phe Asp Thr Glu Arg Asp Val Leu Leu Ala
370 375 380

Trp Arg Asp Phe Ile Arg Glu Val Asp Pro Asp Ile Ile Ile Gly Tyr
385 390 395 400

Asn Ile Cys Lys Phe Asp Leu Pro Tyr Leu Ile Glu Arg Ala Glu Val

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405	410	415
Leu Lys Ile Val Glu Phe Pro Ile Leu Gly Arg Ile Arg Asn Ser Arg		
420	425	430
Val Arg Val Arg Asp Thr Thr Phe Ser Ser Arg Gln Tyr Gly Met Arg		
435	440	445
Glu Ser Lys Asp Val Ala Val Glu Gly Arg Val Gln Phe Asp Leu Leu		
450	455	460
Gln Ala Met Gln Arg Asp Tyr Lys Leu Ser Ser Tyr Ser Leu Asn Ser		
465	470	475 480
Val Ser Ala His Phe Leu Gly Glu Gln Lys Glu Asp Val His His Ser		
485	490	495
Ile Ile Ser Asp Leu Gln Asn Gly Asn Ser Glu Thr Arg Arg Arg Leu		
500	505	510
Ala Val Tyr Cys Leu Lys Asp Ala Tyr Leu Pro Gln Arg Leu Leu Asp		
515	520	525
Lys Leu Met Tyr Ile Tyr Asn Tyr Val Glu Met Ala Arg Val Thr Gly		
530	535	540
Val Pro Ile Ser Phe Leu Leu Ser Arg Gly Gln Ser Ile Lys Val Leu		
545	550	555 560
Ser Gln Leu Leu Arg Lys Ala Lys Gln Lys Asn Leu Val Ile Pro Asn		
565	570	575
Ile Lys Gly Gln Ala Ser Gly Gln Asp Thr Phe Glu Gly Ala Thr Val		
580	585	590
Leu Glu Ala Arg Ala Gly Phe Tyr Glu Lys Pro Ile Ala Thr Leu Asp		

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595	600	605
Phe Ala Ser Leu Tyr Pro Ser Ile Met Met Ala Tyr Asn Leu Cys Tyr		
610	615	620
Cys Thr Leu Val Pro Pro Glu Asp Ala Arg Lys Leu Asn Leu Pro Pro		
625	630	635 640
Glu Ser Val Asn Lys Thr Pro Ser Gly Glu Thr Phe Val Lys Pro Asp		
645	650	655
Val Gln Lys Gly Ile Leu Pro Glu Ile Leu Glu Glu Leu Leu Ala Ala		
660	665	670
Arg Lys Arg Ala Lys Ala Asp Leu Lys Glu Ala Lys Asp Pro Phe Glu		
675	680	685
Arg Ala Val Leu Asp Gly Arg Gln Leu Ala Leu Lys Ile Ser Ala Asn		
690	695	700
Ser Val Tyr Gly Phe Thr Gly Ala Thr Val Gly Gln Leu Pro Cys Leu		
705	710	715 720
Glu Ile Ser Ser Ser Val Thr Ser Tyr Gly Arg Gln Met Ile Glu His		
725	730	735
Thr Lys Lys Leu Val Glu Asp Lys Phe Thr Thr Leu Gly Gly Tyr Glu		
740	745	750
His Asn Ala Glu Val Ile Tyr Gly Asp Thr Asp Ser Val Met Val Gln		
755	760	765
Phe Gly Val Ser Thr Val Glu Asp Ala Met Lys Leu Gly Arg Glu Ala		
770	775	780
Ala Asp Tyr Ile Ser Gly Thr Phe Ile Lys Pro Ile Lys Leu Glu Phe		
785	790	795 800

70/236

Glu Lys Ile Tyr Phe Pro Tyr Leu Leu Ile Ser Lys Lys Arg Tyr Ala
805 810 815

Gly Leu Tyr Trp Thr Asn Pro Glu Lys Phe Asp Lys Met Asp Thr Lys
820 825 830

Gly Ile Glu Thr Val Arg Arg Asp Asn Cys Leu Leu Val Lys Asn Leu
835 840 845

Val Thr Glu Cys Leu His Lys Ile Leu Val Asp Arg Asp Val Pro Gly
850 855 860

Ala Val Gln Tyr Val Lys Asn Thr Ile Ser Asp Leu Leu Met Asn Arg
865 870 875 880

Val Asp Leu Ser Leu Leu Val Ile Thr Lys Gly Leu Thr Lys Thr Gly
885 890 895

Glu Asp Tyr Ala Val Lys Ala Ala His Val Glu Leu Ala Glu Arg Met
900 905 910

Arg Lys Arg Asp Ala Ala Thr Ala Pro Thr Val Gly Asp Arg Val Pro
915 920 925

Tyr Val Ile Ile Lys Ala Ala Lys Gly Ala Lys Ala Tyr Glu Arg Ser
930 935 940

Glu Asp Pro Ile Tyr Val Leu Asp Asn Asn Ile Pro Ile Asp Pro Gln
945 950 955 960

Tyr Tyr Leu Glu Asn Gln Ile Ser Lys Pro Leu Leu Arg Ile Phe Glu
965 970 975

Pro Ile Leu Lys Asn Ala Ser Arg Glu Leu Leu His Gly Ser His Thr
980 985 990

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Arg Ala Val Ser Ile Ser Thr Pro Ser Asn Ser Gly Ile Met Lys Phe
 995 1000 1005

Ala Lys Lys Gln Leu Thr Cys Leu Gly Cys Lys Ala Val Ile Ser Gly
 1010 1015 1020

Ser Asn Gln Thr Leu Cys Phe His Cys Lys Gly Arg Glu Ala Glu Leu
 1025 1030 1035 1040

Tyr Cys Lys Thr Val Gly Asn Val Ser Glu Leu Glu Met Leu Phe Gly
 1045 1050 1055

Arg Leu Trp Thr Gln Cys Gln Glu Cys Gln Gly Ser Leu His Gln Asp
 1060 1065 1070

Val Leu Cys Thr Ser Arg Asp Cys Pro Ile Phe Tyr Arg Arg Arg Lys
 1075 1080 1085

Ala Gln Lys Asp Met Ala Glu Ala Arg Val Gln Leu Gln Arg Trp Asp
 1090 1095 1100

Phe
 1105

<210> 49

<211> 3427

<212> DNA

<213> Glycine max

<400> 49

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 aatgactcag gaagaagagt tcatggacga agaagtgtc cttaacgaa cctcgtctc 180
 caggagcga gaatccctca ttctccgga cattgagcag cgcaggcgc tcgccaacg 240
 cctctccag tggacagtc ctctctctc cgcggctac gtgcaccaat ctctagagt 300
 ccttttcag cagctagaga ttgattacgt gattgcagag agtcacggg agttgtgcc 360

72/236

gaaotcgtot ggacotgtog ccattatoag aatatttggg gttactaagg aaggacacag 420
 tttttgttgo aatgttcag ggittgaaco atattttatc atctgttgcc ctcootggat 480
 gggtoacgat gatatotoco attttoatca aactctcgag ggaaggatga gagaagocaa 540
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 gaacagaact coactgtgt aaacatttgt taatcaaat ttgcagaagg gaataottoc 1980
 tgaataott gaagagctat taacagcogc taaggaggca aaagcagact taaggaggc 2040
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 ttaotatoca taictcctga ttacaaagaa gagatagot ggtttgttt ggacaaaaco 2460
 agacaaactt gacaaatgg acactaaag tattgaanaa gtlogaagag acaattgttt 2520
 attgtcaaa aaotggtga agattgoot taacaaata ttgattgaca gggacattcc 2580

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tggggcagto cagtatgtoa agaatgcaat ttcagatott otcatgaato giatggactt 2640
 atcaacttotg gttattacaa agggtttaac gaagacagga gatgattacg aagtaaaagc 2700
 agotcatgtt gaacttgotg aaaggatgog caagcgagat gotgccactg ctccaaatgt 2760
 tggagacaga gtaoatatag ttattattaa agctgcaaaa ggtgcaaaag catatgagag 2820
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 gagggccaa gttcacttca tcaggatatt ctctgcacaa gtgggattg tocaatttto 3240
 tatcgacga aaaaggcaca gaaagatatg ggtgaagcaa agttgaattt ggacagatgg 3300
 aacttctaag ttttgocaag aatttgaact tgggatoto ttogaacaa tggacacaaa 3360
 tacaatctgg tgtttgcaac aatcctgaca ttgtaatgt ggttaaago ccacatttg 3420
 ttactg 3427

<210> 50

<211> 1088

<212> PRT

<213> Glycine max

<400> 50

Met Thr Gln Glu Glu Glu Phe Met Asp Glu Asp Val Phe Ile Asn Glu

1

5

10

15

Thr Leu Val Ser Glu Asp Glu Glu Ser Leu Ile Leu Arg Asp Ile Glu

20

25

30

Gln Arg Gln Ala Leu Ala Asn Arg Leu Ser Lys Trp Thr Arg Pro Pro

35

40

45

Leu Ser Ala Gly Tyr Val Ala Gln Ser Arg Ser Val Leu Phe Gln Gln

50

55

60

Leu Glu Ile Asp Tyr Val Ile Ala Glu Ser His Gly Glu Leu Leu Pro

74/236

65	70	75	80
Asn Ser Ser Gly Pro Val Ala Ile Ile Arg Ile Phe Gly Val Thr Lys			
85	90	95	
Glu Gly His Ser Val Cys Cys Asn Val His Gly Phe Glu Pro Tyr Phe			
100	105	110	
Tyr Ile Cys Cys Pro Pro Gly Met Gly Pro Asp Asp Ile Ser His Phe			
115	120	125	
His Gln Thr Leu Glu Gly Arg Met Arg Glu Ala Asn Arg Asn Ser Asn			
130	135	140	
Val Gly Lys Phe Val Arg Arg Ile Glu Met Val Gln Arg Arg Ser Ile			
145	150	155	160
Met Tyr Tyr Gln Gln Ser Asn Ser Gln Pro Phe Leu Lys Ile Val Val			
165	170	175	
Ala Leu Pro Thr Met Val Ala Ser Cys Arg Gly Ile Leu Asp Arg Gly			
180	185	190	
Ile Gln Leu Asp Gly Leu Gly Met Lys Ser Phe Leu Thr Tyr Glu Ser			
195	200	205	
Asn Val Leu Phe Ala Leu Arg Phe Met Ile Asp Cys Asn Ile Val Gly			
210	215	220	
Gly Asn Trp Ile Gly Ile Pro Ala Gly Lys Tyr Lys Lys Thr Ala Lys			
225	230	235	240
Ser Leu Ser Tyr Cys Gln Leu Glu Phe Asp Cys Leu Tyr Ser Glu Leu			
245	250	255	
Ile Ser His Ala Pro Glu Gly Glu Tyr Ser Lys Met Ala Pro Phe Arg			
260	265	270	

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Ile Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys Gly His Phe Pro
275 280 285

Glu Pro Thr His Asp Pro Val Ile Gln Ile Ala Asn Leu Val Thr Leu
290 295 300

Gln Gly Glu Asp Gln Pro Phe Ile Arg Asn Val Met Thr Leu Lys Ser
305 310 315 320

Cys Ser Pro Ile Val Gly Val Asp Val Met Pro Phe Glu Thr Glu Arg
325 330 335

Glu Val Leu Leu Ala Trp Arg Asp Phe Ile Arg Glu Val Asp Pro Asp
340 345 350

Ile Ile Ile Gly Tyr Asn Ile Cys Lys Phe Asp Leu Pro Tyr Leu Ile
355 360 365

Glu Arg Ala Leu Asn Leu Lys Ile Ala Glu Phe Pro Ile Leu Gly Arg
370 375 380

Ile Arg Asn Ser Arg Val Arg Val Lys Asp Thr Thr Phe Ser Ser Arg
385 390 395 400

Gln Tyr Gly Thr Arg Glu Ser Lys Glu Val Ala Val Glu Gly Arg Val
405 410 415

Thr Phe Asp Leu Leu Gln Val Met Gln Arg Asp Tyr Lys Leu Ser Ser
420 425 430

Tyr Ser Leu Asn Ser Val Ser Ser His Phe Leu Ser Glu Gln Lys Glu
435 440 445

Asp Val His His Ser Ile Ile Ser Asp Leu Gln Asn Gly Asn Ala Glu
450 455 460

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Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu Lys Asp Ala Tyr Leu Pro
465 470 475 480

Gln Arg Leu Leu Asp Lys Leu Met Phe Ile Tyr Asn Tyr Val Glu Met
485 490 495

Ala Arg Val Thr Gly Val Pro Ile Ser Phe Leu Leu Ser Arg Gly Gln
500 505 510

Ser Ile Lys Val Leu Ser Gln Leu Leu Arg Arg Ala Arg Gln Lys Asn
515 520 525

Leu Val Ile Pro Asn Ala Lys Gln Ala Gly Ser Glu Gln Gly Thr Phe
530 535 540

Glu Gly Ala Thr Val Leu Glu Ala Arg Ala Gly Phe Tyr Glu Lys Pro
545 550 555 560

Ile Ala Thr Leu Asp Phe Ala Ser Leu Tyr Pro Ser Ile Met Met Ala
565 570 575

Tyr Asn Leu Cys Tyr Cys Thr Leu Val Ile Pro Glu Asp Ala Arg Lys
580 585 590

Leu Asn Ile Pro Pro Glu Ser Val Asn Arg Thr Pro Ser Gly Glu Thr
595 600 605

Phe Val Lys Ser Asn Leu Gln Lys Gly Ile Leu Pro Glu Ile Leu Glu
610 615 620

Glu Leu Leu Thr Ala Arg Lys Arg Ala Lys Ala Asp Leu Lys Glu Ala
625 630 635 640

Lys Asp Pro Leu Glu Lys Ala Val Leu Asp Gly Arg Gln Leu Ala Leu
645 650 655

77/236

Lys Ile Ser Ala Asn Ser Val Tyr Gly Phe Thr Gly Ala Thr Ile Gly
660 665 670

Gln Leu Pro Cys Leu Glu Ile Ser Ser Ser Val Thr Ser Tyr Gly Arg
675 680 685

Gln Met Ile Glu His Thr Lys Lys Leu Val Glu Asp Lys Phe Thr Thr
690 695 700

Leu Asn Gly Tyr Glu His Asn Ala Glu Val Ile Tyr Gly Asp Thr Asp
705 710 715 720

Ser Val Met Val Gln Phe Gly Val Ser Ala Val Glu Glu Ala Met Asn
725 730 735

Leu Gly Arg Glu Ala Ala Glu His Ile Ser Gly Thr Phe Thr Lys Pro
740 745 750

Ile Lys Leu Glu Phe Glu Lys Val Tyr Tyr Pro Tyr Leu Leu Ile Ser
755 760 765

Lys Lys Arg Tyr Ala Gly Leu Phe Trp Thr Lys Pro Asp Asn Phe Asp
770 775 780

Lys Met Asp Thr Lys Gly Ile Glu Thr Val Arg Arg Asp Asn Cys Leu
785 790 795 800

Leu Val Lys Asn Leu Val Asn Asp Cys Leu His Lys Ile Leu Ile Asp
805 810 815

Arg Asp Ile Pro Gly Ala Val Gln Tyr Val Lys Asn Ala Ile Ser Asp
820 825 830

Leu Leu Met Asn Arg Met Asp Leu Ser Leu Leu Val Ile Thr Lys Gly
835 840 845

Leu Thr Lys Thr Gly Asp Asp Tyr Glu Val Lys Ala Ala His Val Glu

78/236

850	855	860	
Leu Ala Glu Arg Met Arg Lys Arg Asp Ala Ala Thr Ala Pro Asn Val			
865	870	875	880
Gly Asp Arg Val Pro Tyr Val Ile Ile Lys Ala Ala Lys Gly Ala Lys			
	885	890	895
Ala Tyr Glu Arg Ser Glu Asp Pro Ile Tyr Val Leu Glu Asn Asn Ile			
	900	905	910
Pro Ile Asp Pro His Tyr Tyr Leu Glu Asn Gln Ile Ser Lys Pro Ile			
	915	920	925
Leu Arg Ile Phe Glu Pro Ile Leu Lys Asn Ala Ser Lys Glu Leu Leu			
	930	935	940
His Gly Ser His Thr Arg Ser Ile Ser Ile Ser Thr Pro Ser Asn Ser			
	945	950	955
			960
Gly Ile Leu Arg Phe Ala Lys Lys Gln Leu Pro Ala Leu Val Val Lys			
	965	970	975
Leu Tyr Leu Ala Arg Val Ile Thr Leu Ser Val His Ile Ala Lys Glu			
	980	985	990
Gly Arg Leu Ser Cys Thr Val Lys Gln Tyr Leu Lys Cys Leu Ser Trp			
	995	1000	1005
Arg Cys Phe Leu Gly Gly Cys Gly His Ser Val Arg Ser Ala Lys Val			
	1010	1015	1020
His Phe Ile Arg Met Phe Ser Ala Pro Val Gly Ile Val Gln Phe Ser			
	1025	1030	1035
			1040
Ile Asp Glu Lys Arg His Arg Lys Ile Trp Val Lys Gln Ser Cys Asn			
	1045	1050	1055

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Trp Thr Asp Gly Thr Ser Lys Phe Cys Gln Glu Phe Asp Leu Ala Asp
 1080 1065 1070

Leu Phe Glu Pro Met Asp Thr Asn Thr Ile Trp Cys Leu Pro Gln Ser
 1075 1080 1085

<210> 51

<211> 3435

<212> DNA

<213> Homo sapiens

<400> 51

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 aaggacctg aagaccagga gaagtootg cggogottg gacccctg acctgagcc 3360
 tegtacott gcaagcatc catggggcg ggcgggacc agggagaatt aataagttc 3420

81/236

tggaattttg ctaca

3435

<210> 52

<211> 1107

<212> PRT

<213> Homo sapiens

<400> 52

Met Asp Gly Lys Arg Arg Pro Gly Pro Gly Pro Gly Val Pro Pro Lys
 1 5 10 15

Arg Ala Arg Gly Gly Leu Trp Asp Asp Asp Ala Pro Arg Pro Ser
 20 25 30

Gln Phe Glu Glu Asp Leu Ala Leu Met Glu Glu Met Glu Ala Glu His
 35 40 45

Arg Leu Gln Glu Gln Glu Glu Glu Leu Gln Ser Val Leu Glu Gly
 50 55 60

Val Ala Asp Gly Gln Val Pro Pro Ser Ala Ile Asp Pro Arg Trp Leu
 65 70 75 80

Arg Pro Thr Pro Pro Ala Leu Asp Pro Gln Thr Glu Pro Leu Ile Phe
 85 90 95

Gln Gln Leu Glu Ile Asp His Tyr Val Gly Pro Ala Gln Pro Val Pro
 100 105 110

Gly Gly Pro Pro Pro Ser His Gly Ser Val Pro Val Leu Arg Ala Phe
 115 120 125

Gly Val Thr Asp Glu Gly Phe Ser Val Cys Cys His Ile His Gly Phe
 130 135 140

Ala Pro Tyr Phe Tyr Thr Pro Ala Pro Pro Gly Phe Gly Pro Glu His

82/236

145	150	155	160
Met Gly Asp Leu Gln Arg Glu Leu Asn Leu Ala Ile Asn Arg Asp Ser			
165	170	175	
Arg Gly Gly Arg Glu Leu Thr Gly Pro Ala Val Leu Ala Val Glu Leu			
180	185	190	
Cys Ser Arg Glu Ser Met Phe Gly Tyr His Gly His Gly Pro Ser Pro			
195	200	205	
Phe Leu Arg Ile Thr Val Ala Leu Pro Arg Leu Val Ala Pro Ala Arg			
210	215	220	
Arg Leu Leu Glu Gln Gly Ile Arg Val Ala Gly Leu Gly Thr Pro Ser			
225	230	235	240
Phe Ala Pro Tyr Glu Ala Asn Val Asp Phe Glu Ile Arg Phe Met Val			
245	250	255	
Asp Thr Asp Ile Val Gly Cys Asn Trp Leu Glu Leu Pro Ala Gly Lys			
260	265	270	
Tyr Ala Leu Arg Leu Lys Glu Lys Ala Thr Gln Cys Gln Leu Glu Ala			
275	280	285	
Asp Val Leu Trp Ser Asp Val Val Ser His Pro Pro Glu Gly Pro Trp			
290	295	300	
Gln Arg Ile Ala Pro Leu Arg Val Leu Ser Phe Asp Ile Glu Cys Ala			
305	310	315	320
Gly Arg Lys Gly Ile Phe Pro Glu Pro Glu Arg Asp Pro Val Ile Gln			
325	330	335	
Ile Cys Ser Leu Gly Leu Arg Trp Gly Glu Pro Glu Pro Phe Leu Arg			
340	345	350	

83/236

Leu Ala Leu Thr Leu Arg Pro Cys Ala Pro Ile Leu Gly Ala Lys Val
355 380 365

Gln Ser Tyr Glu Lys Glu Glu Asp Leu Leu Gln Ala Trp Ser Thr Phe
370 375 380

Ile Arg Ile Met Asp Pro Asp Val Ile Thr Gly Tyr Asn Ile Gln Asn
385 390 395 400

Phe Asp Leu Pro Tyr Leu Ile Ser Arg Ala Gln Thr Leu Lys Val Gln
405 410 415

Thr Phe Pro Phe Leu Gly Arg Val Ala Gly Leu Cys Ser Asn Ile Arg
420 425 430

Asp Ser Ser Phe Gln Ser Lys Gln Thr Gly Arg Arg Asp Thr Lys Val
435 440 445

Val Ser Met Val Gly Arg Val Gln Met Asp Met Leu Gln Val Leu Leu
450 455 460

Arg Glu Tyr Lys Leu Arg Ser Tyr Thr Leu Asn Ala Val Ser Phe His
465 470 475 480

Phe Leu Gly Glu Gln Lys Glu Asp Val Gln His Ser Ile Ile Thr Asp
485 490 495

Leu Gln Asn Gly Asn Asp Gln Thr Arg Arg Arg Leu Ala Val Tyr Cys
500 505 510

Leu Lys Asp Ala Tyr Leu Pro Leu Arg Leu Leu Glu Arg Leu Met Val
515 520 525

Leu Val Asn Ala Val Glu Met Ala Arg Val Thr Gly Val Pro Leu Ser
530 535 540

84/236

Tyr Leu Leu Ser Arg Gly Gln Gln Val Lys Val Val Ser Gln Leu Leu
545 550 555 560

Arg Gln Ala Met His Glu Gly Leu Leu Met Pro Val Val Lys Ser Glu
565 570 575

Gly Gly Glu Asp Tyr Thr Gly Ala Thr Val Ile Glu Pro Leu Lys Gly
580 585 590

Tyr Tyr Asp Val Pro Ile Ala Thr Leu Asp Phe Ser Ser Leu Tyr Pro
595 600 605

Ser Ile Met Met Ala His Asn Leu Cys Tyr Thr Thr Leu Leu Arg Pro
610 615 620

Gly Thr Ala Gln Lys Leu Gly Leu Thr Glu Asp Gln Phe Ile Arg Thr
625 630 635 640

Pro Thr Gly Asp Glu Phe Val Lys Thr Ser Val Arg Lys Gly Leu Leu
645 650 655

Pro Gln Ile Leu Glu Asn Leu Leu Ser Ala Arg Lys Arg Ala Lys Ala
660 665 670

Glu Leu Ala Lys Glu Thr Asp Pro Leu Arg Arg Gln Val Leu Asp Gly
675 680 685

Arg Gln Leu Ala Leu Lys Val Ser Ala Asn Ser Val Tyr Gly Phe Thr
690 695 700

Gly Ala Gln Val Gly Lys Leu Pro Cys Leu Glu Ile Ser Gln Ser Val
705 710 715 720

Thr Gly Phe Gly Arg Gln Met Ile Glu Lys Thr Lys Gln Leu Val Glu
725 730 735

Ser Lys Tyr Thr Val Glu Asn Gly Tyr Ser Thr Ser Ala Lys Val Val

85/236

740	745	750
Tyr Gly Asp Thr Asp Ser Val	Met Cys Arg Phe Gly Val	Ser Ser Val
755	760	765
Ala Glu Ala Met Ala Leu Gly Gly Glu Ala Ala	Asp Trp Val	Ser Gly
770	775	780
His Phe Pro Ser Pro Ile Arg Leu Glu Phe Glu Lys Val	Tyr Phe Pro	
785	790	795 800
Tyr Leu Leu Ile Ser Lys Lys Arg Tyr Ala Gly Leu Leu Phe Ser Ser		
805	810	815
Arg Pro Asp Ala His Asp Arg Met Asp Cys Lys Gly Leu Glu Ala Val		
820	825	830
Arg Arg Asp Asn Cys Pro Leu Val Ala Asn Leu Val Thr Ala Ser Leu		
835	840	845
Arg Arg Leu Leu Ile Asp Arg Asp Pro Glu Gly Ala Val Ala His Ala		
850	855	860
Gln Asp Val Ile Ser Asp Leu Leu Cys Asn Arg Ile Asp Ile Ser Gln		
865	870	875 880
Leu Val Ile Thr Lys Glu Leu Thr Arg Ala Ala Ser Asp Tyr Ala Gly		
885	890	895
Lys Gln Ala His Val Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Pro		
900	905	910
Gly Ser Ala Pro Ser Leu Gly Asp Arg Val Pro Tyr Val Ile Ile Ser		
915	920	925
Ala Ala Lys Gly Val Ala Ala Tyr Met Lys Ser Glu Asp Pro Leu Phe		
930	935	940

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Val Leu Glu His Ser Leu Pro Ile Asp Thr Gln Tyr Tyr Leu Glu Gln
 945 950 955 960

Gln Leu Ala Lys Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu Gly Glu
 965 970 975

Gly Arg Ala Glu Ala Val Leu Leu Arg Gly Asp His Thr Arg Cys Lys
 980 985 990

Thr Val Leu Thr Gly Lys Val Gly Gly Leu Leu Ala Phe Ala Lys Arg
 995 1000 1005

Arg Asn Cys Cys Ile Gly Cys Arg Thr Val Leu Ser His Gln Gly Ala
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Val Cys Glu Phe Cys Gln Pro Arg Glu Ser Glu Leu Tyr Gln Lys Glu
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Val Ser His Leu Asn Ala Leu Glu Glu Arg Phe Ser Arg Leu Trp Thr
 1045 1050 1055

Gln Cys Gln Arg Cys Gln Gly Ser Leu His Glu Asp Val Ile Cys Thr
 1060 1065 1070

Ser Arg Asp Cys Pro Ile Phe Tyr Met Arg Lys Lys Val Arg Lys Asp
 1075 1080 1085

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Glu Ala Trp
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<211> 6912

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<212> DNA

<213> Homo sapiens

<400> 53

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 35 40 45
 Gly Phe Glu Arg Leu Lys Glu Pro Gly Glu Lys Thr Gly Trp Leu Ile
 50 55 60
 Asn Met His Pro Thr Glu Ile Leu Asp Glu Asp Lys Arg Leu Gly Ser
 65 70 75 80
 Ala Val Asp Tyr Tyr Phe Ile Gln Asp Asp Gly Ser Arg Phe Lys Val
 85 90 95
 Ala Leu Pro Tyr Lys Pro Tyr Phe Tyr Ile Ala Thr Arg Lys Gly Cys
 100 105 110

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Glu Arg Glu Val Ser Ser Phe Leu Ser Lys Lys Phe Gln Gly Lys Ile
115 120 125

Ala Lys Val Glu Thr Val Pro Lys Glu Asp Leu Asp Leu Pro Asn His
130 135 140

Leu Val Gly Leu Lys Arg Asn Tyr Ile Arg Leu Ser Phe His Thr Val
145 150 155 160

Glu Asp Leu Val Lys Val Arg Lys Glu Ile Ser Pro Ala Val Lys Lys
165 170 175

Asn Arg Glu Gln Asp His Ala Ser Asp Ala Tyr Thr Ala Leu Leu Ser
180 185 190

Ser Val Leu Gln Arg Gly Gly Val Ile Thr Asp Glu Glu Glu Thr Ser
195 200 205

Lys Lys Ile Ala Asp Gln Leu Asp Asn Ile Val Asp Met Arg Glu Tyr
210 215 220

Asp Val Pro Tyr His Ile Arg Leu Ser Ile Asp Leu Lys Ile His Val
225 230 235 240

Ala His Trp Tyr Asn Val Arg Tyr Arg Gly Asn Ala Phe Pro Val Glu
245 250 255

Ile Thr Arg Arg Asp Asp Leu Val Glu Arg Pro Asp Pro Val Val Leu
260 265 270

Ala Phe Asp Ile Glu Thr Thr Lys Leu Pro Leu Lys Phe Pro Asp Ala
275 280 285

Glu Thr Asp Gln Ile Met Met Ile Ser Tyr Met Ile Asp Gly Gln Gly
290 295 300

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Tyr Leu Ile Thr Asn Arg Glu Ile Val Ser Glu Asp Ile Glu Asp Phe
305 310 315 320

Glu Phe Thr Pro Lys Pro Glu Tyr Glu Gly Pro Phe Cys Val Phe Asn
325 330 335

Glu Pro Asp Glu Ala His Leu Ile Gln Arg Trp Phe Glu His Val Gln
340 345 350

Glu Thr Lys Pro Thr Ile Met Val Thr Tyr Asn Gly Asp Phe Phe Asp
355 360 365

Trp Pro Phe Val Glu Ala Arg Ala Ala Val His Gly Leu Ser Met Gln
370 375 380

Gln Glu Ile Gly Phe Gln Lys Asp Ser Gln Gly Glu Tyr Lys Ala Pro
385 390 395 400

Gln Cys Ile His Met Asp Cys Leu Arg Trp Val Lys Arg Asp Ser Tyr
405 410 415

Leu Pro Val Gly Ser His Asn Leu Lys Ala Ala Ala Lys Ala Lys Leu
420 425 430

Gly Tyr Asp Pro Val Glu Leu Asp Pro Glu Asp Met Cys Arg Met Ala
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Thr Glu Gln Pro Gln Thr Leu Ala Thr Tyr Ser Val Ser Asp Ala Val
450 455 460

Ala Thr Tyr Tyr Leu Tyr Met Lys Tyr Val His Pro Phe Ile Phe Ala
465 470 475 480

Leu Cys Thr Ile Ile Pro Met Glu Pro Asp Glu Val Leu Arg Lys Gly
485 490 495

Ser Gly Thr Leu Cys Glu Ala Leu Leu Met Val Gln Ala Phe His Ala

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500	505	510
Asn Ile Ile Phe Pro Asn Lys Gln Glu Gln Glu Phe Asn Lys Leu Thr		
515	520	525
Asp Asp Gly His Val Leu Asp Ser Glu Thr Tyr Val Gly Gly His Val		
530	535	540
Glu Ala Leu Glu Ser Gly Val Phe Arg Ser Asp Ile Pro Cys Arg Phe		
545	550	555 560
Arg Met Asn Pro Ala Ala Phe Asp Phe Leu Leu Gln Arg Val Glu Lys		
565	570	575
Thr Leu Arg His Ala Leu Glu Glu Glu Glu Lys Val Pro Val Glu Gln		
580	585	590
Val Thr Asn Phe Glu Glu Val Cys Asp Glu Ile Lys Ser Lys Leu Ala		
595	600	605
Ser Leu Lys Asp Val Pro Ser Arg Ile Glu Cys Pro Leu Ile Tyr His		
610	615	620
Leu Asp Val Gly Ala Met Tyr Pro Asn Ile Ile Leu Thr Asn Arg Leu		
625	630	635 640
Gln Pro Ser Ala Met Val Asp Glu Ala Thr Cys Ala Ala Cys Asp Phe		
645	650	655
Asn Lys Pro Gly Ala Asn Cys Gln Arg Lys Met Ala Trp Gln Trp Arg		
660	665	670
Gly Glu Phe Met Pro Ala Ser Arg Ser Glu Tyr His Arg Ile Gln His		
675	680	685
Gln Leu Glu Ser Glu Lys Phe Pro Pro Leu Phe Pro Glu Gly Pro Ala		
690	695	700

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Arg Ala Phe His Glu Leu Ser Arg Glu Glu Gln Ala Lys Tyr Glu Lys
705 710 715 720

Arg Arg Leu Ala Asp Tyr Cys Arg Lys Ala Tyr Lys Lys Ile His Ile
725 730 735

Thr Lys Val Glu Glu Arg Leu Thr Thr Ile Cys Gln Arg Glu Asn Ser
740 745 750

Phe Tyr Val Asp Thr Val Arg Ala Phe Arg Asp Arg Arg Tyr Glu Phe
755 760 765

Lys Gly Leu His Lys Val Trp Lys Lys Lys Leu Ser Ala Ala Val Glu
770 775 780

Val Gly Asp Ala Ala Glu Val Lys Arg Cys Lys Asn Met Glu Val Leu
785 790 795 800

Tyr Asp Ser Leu Gln Leu Ala His Lys Cys Ile Leu Asn Ser Phe Tyr
805 810 815

Gly Tyr Val Met Arg Lys Gly Ala Arg Trp Tyr Ser Met Glu Met Ala
820 825 830

Gly Ile Val Cys Phe Thr Gly Ala Asn Ile Ile Thr Gln Ala Arg Glu
835 840 845

Leu Ile Glu Gln Ile Gly Arg Pro Leu Glu Leu Asp Thr Asp Gly Ile
850 855 860

Trp Cys Val Leu Pro Asn Ser Phe Pro Glu Asn Phe Val Phe Lys Thr
865 870 875 880

Thr Asn Val Lys Lys Pro Lys Val Thr Ile Ser Tyr Pro Gly Ala Met
885 890 895

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Leu Asn Ile Met Val Lys Glu Gly Phe Thr Asn Asp Gln Tyr Gln Glu
900 905 910

Leu Ala Glu Pro Ser Ser Leu Thr Tyr Val Thr Arg Ser Glu Asn Ser
915 920 925

Ile Phe Phe Glu Val Asp Gly Pro Tyr Leu Ala Met Ile Leu Pro Ala
930 935 940

Ser Lys Glu Glu Gly Lys Lys Leu Lys Lys Arg Tyr Ala Val Phe Asn
945 950 955 960

Glu Asp Gly Ser Leu Ala Glu Leu Lys Gly Phe Glu Val Lys Arg Arg
965 970 975

Gly Glu Leu Gln Leu Ile Lys Ile Phe Gln Ser Ser Val Phe Glu Ala
980 985 990

Phe Leu Lys Gly Ser Thr Leu Glu Glu Val Tyr Gly Ser Val Ala Lys
995 1000 1005

Val Ala Asp Tyr Trp Leu Asp Val Leu Tyr Ser Lys Ala Ala Asn Met
1010 1015 1020

Pro Asp Ser Glu Leu Phe Glu Leu Ile Ser Glu Asn Arg Ser Met Ser
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Arg Lys Leu Glu Asp Tyr Gly Glu Gln Lys Ser Thr Ser Ile Ser Thr
1045 1050 1055

Ala Lys Arg Leu Ala Glu Phe Leu Gly Asp Gln Met Val Lys Asp Ala
1060 1065 1070

Gly Leu Ser Cys Arg Tyr Ile Ile Ser Arg Lys Pro Glu Gly Ser Pro
1075 1080 1085

Val Thr Glu Arg Ala Ile Pro Leu Ala Ile Phe Gln Ala Glu Pro Thr

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1090	1095	1100
Val Arg Lys His Phe Leu Arg Lys Trp Leu Lys Ser Ser Ser Leu Gln		
1105	1110	1115 1120
Asp Phe Asp Ile Arg Ala Ile Leu Asp Trp Asp Tyr Tyr Ile Glu Arg		
	1125	1130 1135
Leu Gly Ser Ala Ile Gln Lys Ile Ile Thr Ile Pro Ala Ala Leu Gln		
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	1185	1190 1195 1200
Ser Glu Asp Ser Pro Arg Pro Ser Ala Pro Asp Met Glu Asp Phe Gly		
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Leu Val Lys Leu Pro His Pro Ala Ala Pro Val Thr Val Lys Arg Lys		
	1220	1225 1230
Arg Val Leu Trp Glu Ser Gln Glu Glu Ser Gln Asp Leu Thr Pro Thr		
	1235	1240 1245
Val Pro Trp Gln Glu Ile Leu Gly Gln Pro Pro Ala Leu Gly Thr Ser		
	1250	1255 1260
Gln Glu Glu Trp Leu Val Trp Leu Arg Phe His Lys Lys Lys Trp Gln		
	1265	1270 1275 1280
Leu Gln Ala Arg Gln Arg Leu Ala Arg Arg Lys Arg Gln Arg Leu Glu		
	1285	1290 1295

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Ser Ala Glu Gly Val Leu Arg Pro Gly Ala Ile Arg Asp Gly Pro Ala
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Thr Gly Leu Gly Ser Phe Leu Arg Arg Thr Ala Arg Ser Ile Leu Asp
1315 1320 1325

Leu Pro Trp Gln Ile Val Gln Ile Ser Glu Thr Ser Gln Ala Gly Leu
1330 1335 1340

Phe Arg Leu Trp Ala Leu Val Gly Ser Asp Leu His Cys Ile Arg Leu
1345 1350 1355 1360

Ser Ile Pro Arg Val Phe Tyr Val Asn Gln Arg Val Ala Lys Ala Glu
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Glu Gly Ala Ser Tyr Arg Lys Val Asn Arg Val Leu Pro Arg Ser Asn
1380 1385 1390

Met Val Tyr Asn Leu Tyr Glu Tyr Ser Val Pro Glu Asp Met Tyr Gln
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Glu His Ile Asn Glu Ile Asn Ala Glu Leu Ser Ala Pro Asp Ile Glu
1410 1415 1420

Gly Val Tyr Glu Thr Gln Val Pro Leu Leu Phe Arg Ala Leu Val His
1425 1430 1435 1440

Leu Gly Cys Val Cys Val Val Asn Lys Gln Leu Val Arg His Leu Ser
1445 1450 1455

Gly Trp Glu Ala Glu Thr Phe Ala Leu Glu His Leu Glu Met Arg Ser
1460 1465 1470

Leu Ala Gln Phe Ser Tyr Leu Glu Pro Gly Ser Ile Arg His Ile Tyr
1475 1480 1485

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Leu Tyr His His Ala Gln Ala His Lys Ala Leu Phe Gly Ile Phe Ile
1490 1495 1500

Pro Ser Gln Arg Arg Ala Ser Val Phe Val Leu Asp Thr Val Arg Ser
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Asn Gln Met Pro Ser Leu Gly Ala Leu Tyr Ser Ala Glu His Gly Leu
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Leu Leu Glu Lys Val Gly Pro Glu Leu Leu Pro Pro Pro Lys His Thr
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Phe Glu Val Arg Ala Glu Thr Asp Leu Lys Thr Ile Cys Arg Ala Ile
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Gln Arg Phe Leu Leu Ala Tyr Lys Glu Glu Arg Arg Gly Pro Thr Leu
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Ile Ala Val Gln Ser Ser Trp Glu Leu Lys Arg Leu Ala Ser Glu Ile
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Pro Val Leu Glu Glu Phe Pro Leu Val Pro Ile Cys Val Ala Asp Lys
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Ile Asn Tyr Gly Val Leu Asp Trp Gln Arg His Gly Ala Arg Arg Met
1620 1625 1630

Ile Arg His Tyr Leu Asn Leu Asp Thr Cys Leu Ser Gln Ala Phe Glu
1635 1640 1645

Met Ser Arg Tyr Phe His Ile Pro Ile Gly Asn Leu Pro Glu Asp Ile
1650 1655 1660

Ser Thr Phe Gly Ser Asp Leu Phe Phe Ala Arg His Leu Gln Arg His
1665 1670 1675 1680

Asn His Leu Leu Trp Leu Ser Pro Thr Ala Arg Pro Asp Leu Gly Gly

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Thr Val Glu Ile Asn Ser Ser Gly Cys Tyr Ser Thr Val Cys Val Glu		
1715	1720	1725
Leu Asp Leu Gln Asn Leu Ala Val Asn Thr Ile Leu Gln Ser His His		
1730	1735	1740
Val Asn Asp Met Glu Gly Ala Asp Ser Met Gly Ile Ser Phe Asp Val		
1745	1750	1755
		1760
Ile Gln Gln Ala Ser Leu Glu Asp Met Ile Thr Gly Gly Gln Ala Ala		
1765	1770	1775
Ser Ala Pro Ala Ser Tyr Asp Glu Thr Ala Leu Cys Ser Asn Thr Phe		
1780	1785	1790
Arg Ile Leu Lys Ser Met Val Val Gly Trp Val Lys Glu Ile Thr Gln		
1795	1800	1805
Tyr His Asn Ile Tyr Ala Asp Asn Gln Val Met His Phe Tyr Arg Trp		
1810	1815	1820
Leu Arg Ser Pro Ser Ser Leu Leu His Asp Pro Ala Leu His Arg Thr		
1825	1830	1835
		1840
Leu His Asn Met Met Lys Lys Leu Phe Leu Gln Leu Ile Ala Glu Phe		
1845	1850	1855
Lys Arg Leu Gly Ser Ser Val Ile Tyr Ala Asn Phe Asn Arg Ile Ile		
1860	1865	1870
Leu Cys Thr Lys Lys Arg Arg Val Glu Asp Ala Ile Ala Tyr Val Glu		
1875	1880	1885

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Tyr Ile Thr Ser Ser Ile His Ser Lys Glu Thr Phe His Ser Leu Thr
1890 1895 1900

Ile Ser Phe Ser Arg Cys Trp Glu Phe Leu Leu Trp Met Asp Pro Ser
1905 1910 1915 1920

Asn Tyr Gly Gly Ile Lys Gly Lys Val Ser Ser Arg Ile His Cys Gly
1925 1930 1935

Leu Gln Asp Ser Gln Lys Ala Gly Gly Ala Glu Asp Glu Gln Glu Asn
1940 1945 1950

Glu Asp Asp Glu Glu Glu Arg Asp Gly Glu Glu Glu Glu Glu Ala Glu
1955 1960 1965

Glu Ser Asn Val Glu Asp Leu Leu Glu Asn Asn Trp Asn Ile Leu Gln
1970 1975 1980

Phe Leu Pro Gln Ala Ala Ser Cys Gln Asn Tyr Phe Leu Met Ile Val
1985 1990 1995 2000

Ser Ala Tyr Ile Val Ala Val Tyr His Cys Met Lys Asp Gly Leu Arg
2005 2010 2015

Arg Ser Ala Pro Gly Ser Thr Pro Val Arg Arg Arg Gly Ala Ser Gln
2020 2025 2030

Leu Ser Gln Glu Ala Glu Gly Ala Val Gly Ala Leu Pro Gly Met Ile
2035 2040 2045

Thr Phe Ser Gln Asp Tyr Val Ala Asn Glu Leu Thr Gln Ser Phe Phe
2050 2055 2060

Thr Ile Thr Gln Lys Ile Gln Lys Lys Val Thr Gly Ser Arg Asn Ser
2065 2070 2075 2080

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Thr Glu Leu Ser Glu Met Phe Pro Val Leu Pro Gly Ser His Leu Leu
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Leu Asn Asn Pro Ala Leu Glu Phe Ile Lys Tyr Val Cys Lys Val Leu
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Ser Leu Asp Thr Asn Ile Thr Asn Gln Val Asn Lys Leu Asn Arg Asp
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Cys Asn Phe Cys Arg Asp Leu Asp Leu Cys Lys Asp Ser Ser Phe Ser
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Glu Asp Gly Ala Val Leu Pro Gln Trp Leu Cys Ser Asn Cys Gln Ala
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Pro Tyr Asp Ser Ser Ala Ile Glu Met Thr Leu Val Glu Val Leu Gln
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Lys Lys Leu Met Ala Phe Thr Leu Gln Asp Leu Val Cys Leu Lys Cys
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Arg Gly Val Lys Glu Thr Ser Met Pro Val Tyr Cys Thr Cys Ala Gly
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Asp Phe Ala Leu Thr Ile His Thr Gln Val Phe Met Glu Gln Ile Gly
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Ile Phe Arg Asn Ile Ala Gln His Tyr Gly Met Ser Tyr Leu Leu Glu
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102/236

2275

2280

2285

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 <213> Mus musculus

<400> 55

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<400> 58

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Leu Gln Glu Ala Glu Glu Glu Leu Gln Leu Pro Pro Glu Gly Thr Val
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Gly Gly Gln Phe Ser Thr Ala Asp Ile Asp Pro Arg Trp Arg Arg Pro
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Thr Leu Arg Ala Leu Asp Pro Ser Thr Glu Pro Leu Ile Phe Gln Gln
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Leu Glu Ile Asp His Tyr Val Gly Ser Ala Pro Pro Leu Pro Glu Arg
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Pro Leu Pro Ser Arg Asn Ser Val Pro Ile Leu Arg Ala Phe Gly Val
115 120 125

Thr Asp Glu Gly Phe Ser Val Cys Cys His Ile Gln Gly Phe Ala Pro
130 135 140

Tyr Phe Tyr Thr Pro Ala Pro Pro Gly Phe Gly Ala Glu His Leu Ser
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Glu Leu Gln Gln Glu Leu Asn Ala Ala Ile Ser Arg Asp Gln Arg Gly
165 170 175

Gly Lys Glu Leu Ser Gly Pro Ala Val Leu Ala Ile Glu Leu Cys Ser
180 185 190

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Arg Glu Ser Met Phe Gly Tyr His Gly His Gly Pro Ser Pro Phe Leu
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Arg Ile Thr Leu Ala Leu Pro Arg Leu Met Ala Pro Ala Arg Arg Leu
210 215 220

Leu Glu Gln Gly Val Arg Val Pro Gly Leu Gly Thr Pro Ser Phe Ala
225 230 235 240

Pro Tyr Glu Ala Asn Val Asp Phe Glu Ile Arg Phe Met Val Asp Ala
245 250 255

Asp Ile Val Gly Cys Asn Trp Leu Glu Leu Pro Ala Gly Lys Tyr Val
260 265 270

Arg Arg Ala Glu Lys Lys Ala Thr Leu Cys Gln Leu Glu Val Asp Val
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Leu Trp Ser Asp Val Ile Ser His Pro Pro Glu Gly Gln Trp Gln Arg
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Ile Ala Pro Leu Arg Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg
305 310 315 320

Lys Gly Ile Phe Pro Glu Pro Glu Arg Asp Pro Val Ile Gln Ile Cys
325 330 335

Ser Leu Gly Leu Arg Trp Gly Glu Pro Glu Pro Phe Leu Arg Leu Ala
340 345 350

Leu Thr Leu Arg Pro Cys Ala Pro Ile Leu Gly Ala Lys Val Gln Ser
355 360 365

Tyr Glu Arg Glu Glu Asp Leu Leu Gln Ala Trp Ala Asp Phe Ile Leu
370 375 380

Ala Met Asp Pro Asp Val Ile Thr Gly Tyr Asn Ile Gln Asn Phe Asp

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420	425	430	
Ser Phe Gln Ser Arg Gln Val Gly Arg Arg Asp Ser Lys Val Ile Ser			
435	440	445	
Met Val Gly Arg Val Gln Met Asp Met Leu Gln Val Leu Leu Arg Glu			
450	455	460	
His Lys Leu Arg Ser Tyr Thr Leu Asn Ala Val Ser Phe His Phe Leu			
465	470	475	480
Gly Glu Gln Lys Glu Asp Val Gln His Ser Ile Ile Thr Asp Leu Gln			
485	490	495	
Asn Gly Asn Glu Gln Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu Lys			
500	505	510	
Asp Ala Phe Leu Pro Leu Arg Leu Leu Glu Arg Leu Met Val Leu Val			
515	520	525	
Asn Asn Val Glu Met Ala Arg Val Thr Gly Val Pro Leu Gly Tyr Leu			
530	535	540	
Leu Thr Arg Gly Gln Gln Val Lys Val Val Ser Gln Leu Leu Arg Gln			
545	550	555	560
Ala Met Arg Gln Gly Leu Leu Met Pro Val Val Lys Thr Glu Gly Gly			
565	570	575	
Glu Asp Tyr Thr Gly Ala Thr Val Ile Glu Pro Leu Lys Gly Tyr Tyr			
580	585	590	

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595 600 605

Met Met Ala His Asn Leu Cys Tyr Thr Thr Leu Leu Arg Pro Gly Ala
610 615 620

Ala Gln Lys Leu Gly Leu Lys Pro Asp Glu Phe Ile Lys Thr Pro Thr
625 630 635 640

Gly Asp Glu Phe Val Lys Ser Ser Val Arg Lys Gly Leu Leu Pro Gln
645 650 655

Ile Leu Glu Asn Leu Leu Ser Ala Arg Lys Arg Ala Lys Ala Glu Leu
660 665 670

Ala Gln Glu Thr Asp Pro Leu Arg Arg Gln Val Leu Asp Gly Arg Gln
675 680 685

Leu Ala Leu Lys Val Ser Ala Asn Ser Val Tyr Gly Phe Thr Gly Ala
690 695 700

Gln Val Gly Lys Leu Pro Cys Leu Glu Ile Ser Gln Ser Val Thr Gly
705 710 715 720

Phe Gly Arg Gln Met Ile Glu Lys Thr Lys Gln Leu Val Glu Ser Lys
725 730 735

Tyr Thr Val Glu Asn Gly Tyr Asp Ala Asn Ala Lys Val Val Tyr Gly
740 745 750

Asp Thr Asp Ser Val Met Cys Arg Phe Gly Val Ser Ser Val Ala Glu
755 760 765

Ala Met Ser Leu Gly Arg Glu Ala Ala Asn Trp Val Ser Ser His Phe
770 775 780

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785 790 795 800

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Asp Ala His Asp Lys Met Asp Cys Lys Gly Leu Glu Ala Val Arg Arg
820 825 830

Asp Asn Cys Pro Leu Val Ala Asn Leu Val Thr Ser Ser Leu Arg Arg
835 840 845

Ile Leu Val Asp Arg Asp Pro Asp Gly Ala Val Ala His Ala Lys Asp
850 855 860

Val Ile Ser Asp Leu Leu Cys Asn Arg Ile Asp Ile Ser Gln Leu Val
865 870 875 880

Ile Thr Lys Glu Leu Thr Arg Ala Ala Ala Asp Tyr Ala Gly Lys Gln
885 890 895

Ala His Val Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Pro Gly Ser
900 905 910

Ala Pro Ser Leu Gly Asp Arg Val Pro Tyr Val Ile Ile Gly Ala Ala
915 920 925

Lys Gly Val Ala Ala Tyr Met Lys Ser Glu Asp Pro Leu Phe Val Leu
930 935 940

Glu His Ser Leu Pro Ile Asp Thr Gln Tyr Tyr Leu Glu Gln Gln Leu
945 950 955 960

Ala Lys Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu Gly Glu Gly Arg
965 970 975

Ala Glu Ser Val Leu Leu Arg Gly Asp His Thr Arg Cys Lys Thr Val

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		1040
His Leu Asn Ala Leu Glu Glu Arg Phe Ser Arg Leu Trp Thr Gln Cys		
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Gln Arg Cys Gln Gly Ser Leu His Glu Asp Val Ile Cys Thr Ser Arg		
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Asp Cys Pro Ile Phe Tyr Met Arg Lys Lys Val Arg Lys Asp Leu Glu		
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<211> 7119

<212> DNA

<213> Mus musculus

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 <211> 2284
 <212> PRT
 <213> Mus musculus

<400> 58

Met Val Leu Arg Asn Ser Gly Arg Arg His Pro Glu Pro Gly Ala Asp
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Gly Glu Gly Ser Arg Asp Asp Gly Pro Ser Ser Ser Val Ser Ala Leu
 20 25 30

Lys Arg Leu Glu Arg Ser Gln Trp Thr Asp Lys Met Asp Leu Arg Phe
 35 40 45

Gly Phe Glu Arg Leu Lys Glu Pro Gly Glu Arg Thr Gly Trp Leu Ile
 50 55 60

Asn Met His Pro Thr Glu Ile Leu Asp Glu Asp Lys Arg Leu Val Ser
 65 70 75 80

Ala Val Asp Tyr Tyr Phe Ile Gln Asp Asp Gly Ser Arg Phe Lys Val
 85 90 95

Ala Leu Pro Tyr Met Pro Tyr Phe Tyr Ile Ala Ala Arg Lys Gly Cys
 100 105 110

Asp Arg Glu Val Ser Ser Phe Leu Ser Lys Lys Phe Gln Gly Lys Ile
 115 120 125

Ala Lys Leu Glu Asn Val Pro Lys Glu Asp Leu Asp Leu Pro Asn His

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130	135	140	
Leu Val Gly Leu Lys Arg Ser Tyr Ile Lys Leu Ser Phe His Thr Val			
145	150	155	160
Glu Asp Leu Val Lys Val Arg Lys Glu Ile Ser Pro Ala Val Lys Lys			
165	170	175	
Asn Arg Glu Gln Asp His Ala Ser Asp Glu Tyr Thr Thr Met Leu Ser			
180	185	190	
Ser Ile Leu Gln Gly Gly Ser Val Ile Thr Asp Glu Glu Glu Thr Ser			
195	200	205	
Lys Lys Ile Ala Asp Gln Leu Asp Asn Ile Val Asp Met Arg Glu Tyr			
210	215	220	
Asp Val Pro Tyr His Ile Arg Leu Ser Ile Asp Leu Arg Ile His Val			
225	230	235	240
Ala His Trp Tyr Asn Val Arg Phe Arg Gly Asn Ala Phe Pro Val Glu			
245	250	255	
Ile Thr Arg Arg Asp Asp Leu Val Glu Arg Pro Asp Pro Val Val Leu			
260	265	270	
Ala Phe Asp Ile Glu Thr Thr Lys Leu Pro Leu Lys Phe Pro Asp Ala			
275	280	285	
Glu Thr Asp Gln Ile Met Met Ile Ser Tyr Met Ile Asp Gly Gln Gly			
290	295	300	
Tyr Leu Ile Thr Asn Arg Glu Ile Val Ser Glu Asp Ile Glu Asp Phe			
305	310	315	320
Glu Phe Thr Pro Lys Pro Glu Tyr Glu Gly Pro Phe Cys Val Phe Asn			
325	330	335	

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Glu Pro Asp Glu Val His Leu Ile Gln Arg Trp Phe Glu His Ile Gln
340 345 350

Glu Thr Lys Pro Thr Ile Met Val Thr Tyr Asn Gly Asp Phe Phe Asp
355 360 365

Trp Pro Phe Val Glu Ala Arg Ala Ala Ile His Gly Leu Ser Met Tyr
370 375 380

Gln Glu Ile Gly Phe Gln Lys Asp Ser Gln Gly Glu Tyr Lys Ala Pro
385 390 395 400

Gln Cys Ile His Met Asp Cys Leu Arg Trp Val Lys Arg Asp Ser Tyr
405 410 415

Leu Pro Val Gly Ser His Asn Leu Lys Ala Ala Ala Lys Ala Lys Leu
420 425 430

Gly Tyr Asp Pro Val Glu Leu Asp Pro Glu Asp Met Cys Arg Met Ala
435 440 445

Thr Glu Gln Pro Gln Thr Leu Ala Thr Tyr Ser Val Ser Asp Ala Val
450 455 460

Ala Thr Tyr Tyr Leu Tyr Met Lys Tyr Val His Pro Phe Ile Phe Ala
465 470 475 480

Leu Cys Thr Ile Ile Pro Met Glu Pro Asp Glu Val Leu Arg Lys Gly
485 490 495

Ser Gly Thr Leu Cys Glu Ala Leu Leu Met Val Gln Ala Phe His Ala
500 505 510

Asn Ile Ile Phe Pro Asn Lys Gln Glu Gln Glu Phe Asn Lys Leu Thr
515 520 525

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Asp Asp Gly His Val Leu Asp Ala Glu Thr Tyr Val Gly Gly His Val
530 535 540

Glu Ala Leu Glu Ser Gly Val Phe Arg Ser Asp Ile Pro Cys Arg Phe
545 550 555 560

Arg Met Asn Pro Ala Ala Phe Asp Phe Leu Leu Gln Arg Val Glu Lys
565 570 575

Thr Met Arg His Ala Ile Glu Glu Glu Glu Lys Val Pro Val Glu Gln
580 585 590

Ala Thr Asn Phe Gln Glu Val Cys Glu Gln Ile Lys Thr Lys Leu Thr
595 600 605

Ser Leu Lys Asp Val Pro Asn Arg Ile Glu Cys Pro Leu Ile Tyr His
610 615 620

Leu Asp Val Gly Ala Met Tyr Pro Asn Ile Ile Leu Thr Asn Arg Leu
625 630 635 640

Gln Pro Ser Ala Ile Val Asp Glu Ala Thr Cys Ala Ala Cys Asp Phe
645 650 655

Asn Lys Pro Gly Ala Ser Cys Gln Arg Lys Met Ala Trp Gln Trp Arg
660 665 670

Gly Glu Phe Met Pro Ala Ser Arg Ser Glu Tyr His Arg Ile Gln His
675 680 685

Gln Leu Glu Ser Glu Lys Phe Pro Pro Leu Phe Pro Glu Gly Pro Ala
690 695 700

Arg Ala Phe His Glu Leu Ser Arg Glu Glu Gln Ala Lys Tyr Glu Lys
705 710 715 720

Arg Arg Leu Ala Asp Tyr Cys Arg Lys Ala Tyr Lys Lys Ile His Val

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725	730	735
Thr Lys Val Glu Glu Arg Leu Thr Thr Ile Cys Gln Arg Glu Asn Ser		
740	745	750
Phe Tyr Val Asp Thr Val Arg Ala Phe Arg Asp Arg Arg Tyr Glu Phe		
755	760	765
Lys Gly Leu His Lys Val Trp Lys Lys Lys Leu Ser Ala Ala Val Glu		
770	775	780
Val Gly Asp Ala Ser Glu Val Lys Arg Cys Lys Asn Met Glu Ile Leu		
785	790	795
		800
Tyr Asp Ser Leu Gln Leu Ala His Lys Cys Ile Leu Asn Ser Phe Tyr		
805	810	815
Gly Tyr Val Met Arg Lys Gly Ala Arg Trp Tyr Ser Met Glu Met Ala		
820	825	830
Gly Ile Val Cys Phe Thr Gly Ala Asn Ile Ile Thr Gln Ala Arg Glu		
835	840	845
Leu Ile Glu Gln Ile Gly Arg Pro Leu Glu Leu Asp Thr Asp Gly Ile		
850	855	860
Trp Cys Val Leu Pro Asn Ser Phe Pro Glu Asn Phe Val Ile Lys Thr		
865	870	875
		880
Thr Asn Ala Lys Lys Pro Lys Leu Thr Ile Ser Tyr Pro Gly Ala Met		
885	890	895
Leu Asn Ile Met Val Lys Glu Gly Phe Thr Asn His Gln Tyr Gln Glu		
900	905	910
Leu Thr Glu Pro Ser Ser Leu Thr Tyr Val Thr His Ser Glu Asn Ser		

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915	920	925
Ile Phe Phe Glu Val Asp Gly Pro Tyr Leu Ala Met Ile Leu Pro Ala		
930	935	940
Ser Lys Glu Glu Gly Lys Lys Leu Lys Lys Arg Tyr Ala Val Phe Asn		
945	950	955 960
Glu Asp Gly Ser Leu Ala Glu Leu Lys Gly Phe Glu Val Lys Arg Arg		
965	970	975
Gly Glu Leu Gln Leu Ile Lys Ile Phe Gln Ser Ser Val Phe Glu Ala		
980	985	990
Phe Leu Lys Gly Ser Thr Leu Glu Glu Val Tyr Gly Ser Val Ala Lys		
995	1000	1005
Val Ala Asp Tyr Trp Leu Asp Val Leu Tyr Ser Lys Ala Ala Asn Met		
1010	1015	1020
Pro Asp Ser Glu Leu Phe Glu Leu Ile Ser Glu Asn Arg Ser Met Ser		
1025	1030	1035 1040
Arg Lys Leu Glu Asp Tyr Gly Glu Gln Lys Ser Thr Ser Ile Ser Thr		
1045	1050	1055
Ala Lys Arg Leu Ala Glu Phe Leu Gly Asp Gln Met Val Lys Asp Ala		
1060	1065	1070
Gly Leu Ser Cys Arg Tyr Ile Ile Ser Arg Lys Pro Glu Gly Ser Pro		
1075	1080	1086
Val Thr Glu Arg Ala Ile Pro Leu Ala Ile Phe Gln Ala Glu Pro Thr		
1090	1095	1100
Val Arg Lys His Phe Leu Arg Lys Trp Leu Lys Ser Ser Ser Leu Gln		
1105	1110	1115 1120

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Asp Phe Asp Ile Arg Thr Ile Leu Asp Trp Asp Tyr Tyr Ile Glu Arg
1125 1130 1135

Leu Gly Ser Ala Ile Gln Lys Ile Ile Thr Ile Pro Ala Ala Leu Gln
1140 1145 1150

Gln Val Lys Asn Pro Val Pro Arg Val Lys His Pro Asp Trp Leu His
1155 1160 1165

Lys Lys Leu Leu Glu Lys Asn Asp Ile Tyr Lys Gln Lys Lys Ile Ser
1170 1175 1180

Glu Leu Phe Val Leu Glu Gly Lys Arg Gln Ile Val Met Ala Gln Ala
1185 1190 1195 1200

Ser Glu Asn Ser Leu Ser Leu Cys Thr Pro Asp Met Glu Asp Ile Gly
1205 1210 1215

Leu Thr Lys Pro His His Ser Thr Val Pro Val Ala Thr Lys Arg Lys
1220 1225 1230

Arg Val Trp Glu Thr Gln Lys Glu Ser Gln Asp Ile Ala Leu Thr Val
1235 1240 1245

Pro Trp Gln Glu Val Leu Gly Gln Pro Pro Ser Leu Gly Thr Thr Gln
1250 1255 1260

Glu Glu Trp Leu Val Trp Leu Gln Phe His Lys Lys Lys Trp Gln Leu
1265 1270 1275 1280

Gln Ala Gln Gln Arg Leu Ala Leu Arg Lys Lys Gln Arg Leu Glu Ser
1285 1290 1295

Ala Glu Asp Met Pro Arg Leu Gly Pro Ile Arg Glu Glu Pro Ser Thr
1300 1305 1310

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Gly Leu Gly Ser Phe Leu Arg Arg Thr Ala Arg Ser Ile Met Asp Leu
1315 1320 1325

Pro Trp Gln Ile Ile Gln Ile Ser Glu Thr Arg Gln Ala Gly Leu Phe
1330 1335 1340

Arg Leu Trp Ala Ile Ile Gly Asn Asp Leu His Cys Ile Lys Leu Ser
1345 1350 1355 1360

Ile Pro Arg Val Phe Tyr Val Asn Gln Arg Val Ala Lys Ala Glu Asp
1365 1370 1375

Gly Pro Ala Tyr Arg Lys Val Asn Arg Gly Leu Phe Leu Arg Ser Asn
1380 1385 1390

Ile Val Tyr Asn Leu Tyr Glu Tyr Ser Val Pro Glu Asp Met Tyr Gln
1395 1400 1405

Glu His Ile Asn Glu Ile Asn Thr Glu Leu Ser Val Pro Asp Ile Glu
1410 1415 1420

Gly Val Tyr Glu Thr Gln Val Pro Leu Leu Phe Arg Ala Leu Val Gln
1425 1430 1435 1440

Leu Gly Cys Val Cys Val Val Asn Lys Gln Leu Thr Arg His Leu Ser
1445 1450 1455

Gly Trp Glu Ala Glu Thr Phe Ala Leu Glu His Leu Glu Met Arg Ser
1460 1465 1470

Leu Ala Gln Phe Ser Tyr Leu Glu Pro Gly Ser Ile Arg His Ile Tyr
1475 1480 1485

Leu Tyr His His Thr Gln Gly His Lys Ala Leu Phe Gly Val Phe Ile
1490 1495 1500

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Pro Ser Gln Arg Arg Ala Ser Val Phe Val Leu Asp Thr Val Arg Ser
1505 1510 1515 1520

Asn Gln Met Pro Gly Leu Ser Ala Leu Tyr Ser Ser Glu His Ser Leu
1525 1530 1535

Leu Leu Asp Lys Val Asp Pro Lys Leu Leu Pro Pro Pro Lys His Thr
1540 1545 1550

Phe Glu Val Arg Ala Glu Thr Asn Leu Glu Thr Ile Cys Arg Ala Ile
1555 1560 1565

Gln Arg Phe Leu Leu Ala Tyr Lys Glu Glu Arg Arg Gly Pro Thr Leu
1570 1575 1580

Ile Ala Val Gln Ser Ser Trp Glu Leu Cys Arg Leu Thr Ser Glu Ile
1585 1590 1595 1600

Pro Val Leu Glu Glu Phe Pro Leu Val Pro Ile Arg Val Ala Asp Lys
1605 1610 1615

Ile Ser Tyr Ala Val Leu Asp Trp Gln Arg His Gly Ala Arg Arg Met
1620 1625 1630

Ile Arg His Tyr Leu Asn Leu Asp Leu Cys Leu Ser Gln Ala Phe Glu
1635 1640 1645

Met Ser Arg Tyr Phe His Ile Pro Val Gly Asn Leu Pro Glu Asp Ile
1650 1655 1660

Ser Ile Phe Gly Ser Asp Leu Phe Phe Ala Arg His Leu Gln His His
1665 1670 1675 1680

Asn His Leu Leu Trp Leu Ser Pro Thr Ser Arg Pro Asp Leu Gly Gly
1685 1690 1695

Lys Glu Ala Asp Asp Asn Arg Leu Val Met Glu Phe Asp Asp Arg Ala

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1700	1705	1710
Thr Val Glu Ile Asn Ser Ser Gly Cys Tyr Ser Thr Val Cys Val Glu		
1715	1720	1725
Leu Asp Ile Gln Asn Leu Ala Val Asn Thr Ile Leu Gln Ser His His		
1730	1735	1740
Val Asn Asp Met Glu Gly Ala Gly Ser Met Gly Ile Ser Phe Asp Val		
1745	1750	1755
		1760
Ile Gln Gln Ala Ser Leu Glu Asp Met Val Thr Gly Asn Gln Ala Ala		
1765	1770	1775
Ser Ala Leu Ala Asn Tyr Asp Glu Thr Ala Leu Cys Ser Ser Thr Phe		
1780	1785	1790
Arg Ile Leu Lys Ser Met Val Val Gly Trp Val Lys Glu Ile Thr Gln		
1795	1800	1805
Tyr His Asn Ile Tyr Ala Asp Asn Gln Val Met His Phe Tyr Arg Trp		
1810	1815	1820
Leu Gln Ser Pro Cys Ser Leu Leu His Asp Pro Ala Leu His Arg Thr		
1825	1830	1835
		1840
Leu His Asn Met Met Lys Lys Leu Phe Leu Gln Leu Ile Ala Glu Phe		
1845	1850	1855
Lys Arg Leu Gly Ser Ser Val Val Tyr Ala Asn Phe Asn Arg Ile Ile		
1860	1865	1870
Leu Cys Thr Lys Lys Arg Arg Ile Glu Asp Ala Leu Ala Tyr Val Glu		
1875	1880	1885
Tyr Ile Thr Asn Ser Ile His Ser Lys Glu Ile Phe His Ser Leu Thr		
1890	1895	1900

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Ile Ser Phe Ser Arg Cys Trp Glu Phe Leu Leu Trp Met Asp Pro Ser
1905 1910 1915 1920

Asn Tyr Gly Gly Ile Lys Gly Lys Val Pro Ser Ser Ile His Cys Gly
1925 1930 1935

Gln Val Lys Glu Gln Asp Ser Gln Ala Arg Glu Glu Thr Asp Glu Glu
1940 1945 1950

Glu Glu Asp Lys Glu Lys Asp Glu Glu Glu Glu Gly Met Gly Glu Ser
1955 1960 1965

Glu Val Glu Asp Leu Leu Glu Asn Asn Trp Asn Ile Leu Gln Phe Leu
1970 1975 1980

Pro Gln Ala Ala Ser Cys Gln Ser Tyr Phe Leu Met Ile Val Ser Ala
1985 1990 1995 2000

Tyr Ile Val Ala Val Tyr Gln Ser Met Lys Glu Glu Leu Arg His Ser
2005 2010 2015

Ala Pro Gly Ser Thr Pro Val Lys Arg Lys Gly Ala Ser Gln Phe Ser
2020 2025 2030

Gln Glu Ser Glu Gly Ala Thr Gly Ser Leu Pro Gly Met Ile Thr Phe
2035 2040 2045

Ser Gln Asp Tyr Val Ala Asn Glu Leu Thr Gln Ser Phe Phe Thr Ile
2050 2055 2060

Thr Gln Lys Ile Gln Lys Lys Val Thr Gly Ser Arg Asn Thr Thr Glu
2065 2070 2075 2080

Pro Ser Glu Met Phe Pro Val Leu Pro Gly Ser His Leu Leu Leu Asn
2085 2090 2095

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Asn Pro Ala Leu Glu Phe Ile Lys Tyr Val Cys Lys Val Leu Ser Gln
2100 2105 2110

Asp Thr Asn Ile Thr Asn Gln Val Asn Lys Leu Asn Arg Asp Leu Leu
2115 2120 2125

Arg Leu Val Asp Val Gly Glu Phe Ser Glu Glu Ala Gln Phe Arg Asp
2130 2135 2140

Pro Cys His Ser Tyr Val Leu Pro Glu Val Ile Cys His Ser Cys Asn
2145 2150 2155 2160

Phe Cys Arg Asp Leu Asp Leu Cys Lys Asp Ser Ser Phe Ser Gln Asp
2165 2170 2175

Gly Ala Ile Leu Pro Gln Trp Leu Cys Ser Asn Cys Gln Ala Pro Tyr
2180 2185 2190

Asp Ser Ser Ala Ile Glu Ser Ala Leu Val Glu Ala Leu Gln Arg Lys
2195 2200 2205

Leu Met Ala Phe Thr Leu Gln Asp Leu Val Cys Leu Lys Cys Arg Gly
2210 2215 2220

Met Lys Glu Thr His Met Pro Val Tyr Cys Ser Cys Ala Gly Asp Phe
2225 2230 2235 2240

Thr Leu Thr Ile Arg Thr Glu Val Phe Met Glu Gln Ile Arg Ile Phe
2245 2250 2255

Gln Asn Ile Ala Lys Tyr Tyr Ser Met Ser Tyr Leu Gln Glu Thr Ile
2260 2265 2270

Glu Trp Leu Leu Gln Thr Ser Pro Val Ser Asn Cys
2275 2280

125/236

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 <211> 3325
 <212> DNA
 <213> Rattus norvegicus

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<210> 60

<211> 1103

<212> PRT

<213> Rattus norvegicus

<400> 60

Met Asp Gly Lys Arg Arg Gln Ala Pro Ser Ser Gly Val Pro Pro Lys

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5

10

15

Arg Ala Cys Lys Gly Leu Trp Asp Glu Asp Glu Pro Ser Gln Phe Glu

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20	25	30
Glu Asn Leu Ala Leu Leu Glu Glu Ile Glu Ala Glu Asn Arg Leu Gln		
35	40	45
Glu Ala Glu Glu Glu Leu Gln Leu Pro Pro Glu Gly Ile Val Gly Gly		
50	55	60
Gln Phe Ser Thr Ala Asp Ile Asp Pro Arg Trp Leu Arg Pro Thr Pro		
65	70	75 80
Leu Ala Leu Asp Pro Ser Thr Glu Pro Leu Ile Phe Gln Gln Leu Glu		
85	90	95
Ile Asp His Tyr Val Gly Thr Ser Pro Pro Leu Pro Glu Gly Pro Pro		
100	105	110
Ala Ser Arg Asn Ser Val Pro Ile Leu Arg Ala Phe Gly Val Thr Asp		
115	120	125
Glu Gly Phe Ser Val Cys Cys His Ile His Gly Phe Ala Pro Tyr Phe		
130	135	140
Tyr Thr Pro Ala Pro Pro Gly Phe Gly Ala Glu His Leu Ser Glu Leu		
145	150	155 160
Gln Arg Glu Leu Asn Ala Ala Ile Ser Arg Asp Gln Arg Gly Gly Lys		
165	170	175
Glu Leu Ser Gly Pro Ala Val Leu Ala Ile Glu Leu Cys Ser Arg Glu		
180	185	190
Ser Met Phe Gly Tyr His Gly His Gly Pro Ser Pro Phe Leu Arg Ile		
195	200	205
Thr Leu Ala Leu Pro Arg Leu Met Ala Pro Ala Arg Arg Leu Leu Glu		
210	215	220

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Gln Gly Ile Arg Val Pro Gly Leu Gly Thr Pro Ser Phe Ala Pro Tyr
225 230 235 240

Glu Ala Asn Val Asp Phe Glu Ile Arg Phe Met Val Asp Ala Asp Ile
245 250 255

Val Gly Cys Asn Trp Leu Glu Leu Pro Ala Gly Lys Tyr Val Arg Arg
260 265 270

Ala Glu Lys Lys Ala Thr Leu Cys Gln Leu Glu Val Asp Val Leu Trp
275 280 285

Ser Asp Val Ile Ser His Pro Pro Glu Gly Gln Trp Gln Arg Ile Ala
290 295 300

Pro Leu Arg Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg Lys Gly
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Ile Phe Pro Glu Pro Glu Arg Asp Pro Val Ile Gln Ile Cys Ser Leu
325 330 335

Gly Leu Arg Trp Gly Glu Pro Glu Pro Phe Leu Arg Leu Ala Leu Thr
340 345 350

Leu Arg Pro Cys Ala Pro Ile Leu Gly Ala Lys Val Gln Ser Tyr Glu
355 360 365

Arg Glu Glu Asp Leu Leu Gln Ala Trp Ala Thr Phe Ile Leu Ala Met
370 375 380

Asp Pro Asp Val Ile Thr Gly Tyr Asn Ile Gln Asn Phe Asp Leu Pro
385 390 395 400

Tyr Leu Ile Ser Arg Ala Gln Thr Leu Lys Val Asp Arg Phe Pro Phe
405 410 415

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Leu Gly Arg Val Thr Gly Leu Arg Ser Asn Ile Arg Asp Ser Ser Phe
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Gln Ser Arg Gln Val Gly Arg Arg Asp Ser Lys Val Val Ser Met Val
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Gly Arg Val Gln Met Asp Met Leu Gln Val Leu Leu Arg Glu Tyr Lys
450 455 460

Leu Arg Ser Tyr Thr Leu Asn Ala Val Ser Phe His Phe Leu Gly Glu
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Gln Lys Glu Asp Val Gln His Ser Ile Ile Thr Asp Leu Gln Asn Gly
485 490 495

Asn Glu Gln Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu Lys Asp Ala
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Phe Leu Pro Leu Arg Leu Leu Glu Arg Leu Met Val Leu Val Asn Asn
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Val Glu Met Ala Arg Val Thr Gly Val Pro Leu Gly Tyr Leu Leu Ser
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Arg Gly Gln Gln Val Lys Val Val Ser Gln Leu Leu Arg Gln Ala Met
545 550 555 560

Arg Glu Gly Leu Leu Met Pro Val Val Lys Thr Glu Gly Gly Glu Asp
565 570 575

Tyr Thr Gly Ala Thr Val Ile Glu Pro Leu Lys Gly Tyr Tyr Asp Val
580 585 590

Pro Ile Ala Thr Leu Asp Phe Ser Ser Leu Tyr Pro Ser Ile Met Met
595 600 605

Ala His Asn Leu Cys Tyr Thr Thr Leu Leu Arg Pro Gly Ala Ala Gln

130/236

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Leu Lys Val Ser Pro Asn Ser Val Tyr Gly Phe Thr Gly Ala Gln Val		
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Gly Lys Leu Pro Cys Leu Glu Ile Ser Gln Ser Val Thr Gly Phe Gly		
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Arg Gln Met Ile Glu Lys Thr Lys Gln Leu Val Glu Thr Lys Tyr Thr		
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Asp Ser Val Met Cys Arg Phe Gly Val Ser Ser Val Ala Glu Ala Met		
755	760	765
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770	775	780
Pro Ile Arg Leu Glu Phe Glu Lys Val Tyr Phe Pro Tyr Leu Leu Ile		
785	790	795 800
Ser Lys Lys Arg Tyr Ala Gly Leu Leu Phe Ser Ser Arg Ser Asp Ala		
805	810	815

131/236

His Asp Arg Met Asp Cys Lys Gly Leu Glu Ala Val Arg Arg Asp Asn
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Cys Pro Leu Val Ala Asn Leu Val Thr Ser Ser Leu Arg Arg Ile Leu
835 840 845

Val Asp Arg Asp Pro Asp Gly Ala Val Ala His Ala Lys Asp Val Ile
850 855 860

Ser Asp Leu Leu Cys Asn Arg Ile Asp Ile Ser Gln Leu Val Ile Thr
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Lys Glu Leu Thr Arg Ala Ala Ala Asp Tyr Ala Gly Lys Gln Ala His
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Val Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Pro Gly Ser Ala Pro
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Asn Leu Gly Asp Arg Val Pro Tyr Val Ile Ile Gly Ala Ala Lys Gly
915 920 925

Val Ala Ala Tyr Met Lys Ser Glu Asp Pro Leu Phe Val Leu Glu His
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Ser Leu Pro Ile Asp Thr Gln Tyr Tyr Leu Glu Gln Gln Leu Ala Lys
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Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu Gly Glu Gly Arg Ala Glu
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Ser Val Leu Leu Arg Gly Asp His Thr Arg Cys Lys Thr Val Leu Thr
980 985 990

Ser Lys Val Gly Gly Leu Leu Ala Phe Thr Lys Arg Arg Asn Ser Cys
995 1000 1005

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Cys Gln Pro Arg Glu Ser Glu Leu Tyr Gln Lys Glu Val Ser His Leu
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Asn Ala Leu Glu Glu Arg Phe Ser Arg Leu Trp Thr Gln Cys Gln Arg
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Cys Gln Gly Ser Leu His Glu Asp Val Ile Cys Thr Ser Arg Asp Cys
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<211> 3451

<212> DNA

<213> Bos taurus

<400> 61

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 <213> Bos taurus

<400> 62
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 35 40 45
 Arg Leu Gln Glu Gln Glu Glu Glu Glu Leu Gln Ser Ala Leu Glu Ala
 50 55 60
 Ala Asp Gly Gln Phe Ser Pro Thr Ala Ile Asp Ala Arg Trp Leu Arg
 65 70 75 80
 Pro Ala Pro Pro Ala Leu Asp Pro Gln Met Glu Pro Leu Ile Phe Gln
 85 90 95
 Gln Leu Glu Ile Asp His Tyr Val Ala Pro Ala Arg Pro Leu Pro Gly

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100	105	110
Ala Pro Pro Pro Ser Gln Asp Ser Val Pro Ile Leu Arg Ala Phe Gly		
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Val Thr Asn Glu Gly Val Ser Val Cys Cys His Ile His Gly Phe Ala		
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Pro Tyr Phe Tyr Thr Pro Ala Pro Pro Gly Phe Gly Pro Glu His Leu		
145	150	155
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Ser Glu Leu Gln Arg Glu Leu Ser Ala Ala Ile Ser Arg Asp Gln Arg		
165	170	175
Gly Gly Lys Glu Leu Thr Gly Pro Ala Val Leu Ala Val Glu Leu Cys		
180	185	190
Ser Arg Glu Ser Met Phe Gly Tyr His Gly His Gly Pro Ser Pro Phe		
195	200	205
Leu Arg Ile Thr Leu Ala Leu Pro Arg Leu Met Ala Pro Ala Arg Arg		
210	215	220
Leu Leu Glu Gln Gly Ile Arg Leu Ala Gly Leu Gly Thr Pro Ser Phe		
225	230	235
		240
Ala Pro Tyr Glu Ala Asn Val Asp Phe Glu Ile Arg Phe Met Val Asp		
245	250	255
Thr Asp Ile Val Gly Cys Asn Trp Leu Glu Leu Pro Ala Gly Lys Tyr		
260	265	270
Ile Leu Arg Pro Glu Gly Lys Ala Thr Leu Cys Gln Leu Glu Ala Asp		
275	280	285
Val Leu Trp Ser Asp Val Ile Ser His Pro Pro Glu Gly Glu Trp Gln		
290	295	300

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Arg Ile Ala Pro Leu Arg Val Leu Ser Phe Asp Ile Glu Cys Ala Gly
305 310 315 320

Arg Lys Gly Ile Phe Pro Glu Pro Glu Arg Asp Pro Val Ile Gln Ile
325 330 335

Cys Ser Leu Gly Leu Arg Trp Gly Glu Pro Glu Pro Phe Leu Arg Leu
340 345 350

Ala Leu Thr Leu Arg Pro Cys Ala Pro Ile Leu Gly Ala Lys Val Gln
355 360 365

Ser Tyr Glu Arg Glu Glu Asp Leu Leu Gln Ala Trp Ser Thr Phe Ile
370 375 380

Arg Ile Met Asp Pro Asp Val Ile Thr Gly Tyr Asn Ile Gln Asn Phe
385 390 395 400

Asp Leu Pro Tyr Leu Ile Ser Arg Ala Gln Thr Leu Lys Val Pro Gly
405 410 415

Phe Pro Leu Leu Gly Arg Val Ile Gly Leu Arg Ser Asn Ile Arg Glu
420 425 430

Ser Ser Phe Gln Ser Arg Gln Thr Gly Arg Arg Asp Ser Lys Val Val
435 440 445

Ser Met Val Gly Arg Val Gln Met Asp Met Leu Gln Val Leu Leu Arg
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Glu Tyr Lys Leu Arg Ser Tyr Thr Leu Asn Ala Val Ser Phe His Phe
465 470 475 480

Leu Gly Glu Gln Lys Glu Asp Val Gln His Ser Ile Ile Thr Asp Leu
485 490 495

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Gln Asn Gly Asn Asp Gln Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu
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Lys Asp Ala Phe Leu Pro Leu Arg Leu Leu Glu Arg Leu Met Val Leu
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Val Asn Ala Met Glu Met Ala Arg Val Thr Gly Val Pro Leu Gly Tyr
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Leu Leu Ser Arg Gly Gln Gln Val Lys Val Val Ser Gln Leu Leu Arg
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Gln Ala Met Arg Gln Gly Leu Leu Met Pro Val Val Lys Thr Glu Gly
565 570 575

Gly Glu Asp Tyr Thr Gly Ala Thr Val Ile Glu Pro Leu Lys Gly Tyr
580 585 590

Tyr Asp Val Pro Ile Ala Thr Leu Asp Phe Ser Ser Leu Tyr Pro Ser
595 600 605

Ile Met Met Ala His Asn Leu Cys Tyr Thr Thr Leu Leu Arg Pro Gly
610 615 620

Ala Ala Gln Lys Leu Gly Leu Thr Glu Asp Gln Phe Ile Lys Thr Pro
625 630 635 640

Thr Gly Asp Glu Phe Val Lys Ala Ser Val Arg Lys Gly Leu Leu Pro
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Gln Ile Leu Glu Asn Leu Leu Ser Ala Arg Lys Arg Ala Lys Ala Glu
660 665 670

Leu Ala Lys Glu Thr Asp Pro Leu Arg Arg Gln Val Leu Asp Gly Arg
675 680 685

Gln Leu Ala Leu Lys Val Ser Ala Asn Ser Val Tyr Gly Phe Thr Gly

138/236

690	695	700
Ala Gln Val Gly Arg Leu Pro Cys Leu Glu Ile Ser Gln Ser Val Thr		
705	710	715 720
Gly Phe Gly Arg Gln Met Ile Glu Lys Thr Lys Gln Leu Val Glu Thr		
	725	730 735
Lys Tyr Thr Val Glu Asn Gly Tyr Ser Thr Ser Ala Lys Val Val Tyr		
	740	745 750
Gly Asp Thr Asp Ser Val Met Cys Arg Phe Gly Val Ser Ser Val Ala		
	755	760 765
Glu Ala Met Ala Leu Gly Arg Glu Ala Ala Asp Trp Val Ser Gly His		
	770	775 780
Phe Pro Ser Pro Ile Arg Leu Glu Phe Glu Lys Val Tyr Phe Pro Tyr		
	785	790 795 800
Leu Leu Ile Ser Lys Lys Arg Tyr Ala Gly Leu Leu Phe Ser Ser Arg		
	805	810 815
Pro Asp Ala His Asp Arg Met Asp Cys Lys Gly Leu Glu Ala Val Arg		
	820	825 830
Arg Asp Asn Cys Pro Leu Val Ala Asn Leu Val Thr Ala Ser Leu Arg		
	835	840 845
Arg Leu Leu Ile Asp Arg Asp Pro Ser Gly Ala Val Ala His Ala Gln		
	850	855 860
Asp Val Ile Ser Asp Leu Leu Cys Asn Arg Ile Asp Ile Ser Gln Leu		
	865	870 875 880
Val Ile Thr Lys Glu Leu Thr Arg Ala Ala Ala Asp Tyr Ala Gly Lys		
	885	890 895

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Gln Ala His Val Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Pro Gly
900 905 910

Ser Ala Pro Ser Leu Gly Asp Arg Val Pro Tyr Val Ile Ile Ser Ala
915 920 925

Ala Lys Gly Val Ala Ala Tyr Met Lys Ser Glu Asp Pro Leu Phe Val
930 935 940

Leu Glu His Ser Leu Pro Ile Asp Thr Gln Tyr Tyr Leu Glu Gln Gln
945 950 955 960

Leu Ala Lys Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu Gly Glu Gly
965 970 975

Arg Ala Glu Ala Val Leu Leu Arg Gly Asp His Thr Arg Cys Lys Thr
980 985 990

Val Leu Thr Gly Lys Val Gly Gly Leu Leu Ala Phe Ala Lys Arg Arg
995 1000 1005

Asn Cys Cys Ile Gly Cys Arg Thr Val Leu Ser His Gln Gly Ala Val
1010 1015 1020

Cys Lys Phe Cys Gln Pro Arg Glu Ser Glu Leu Tyr Gln Lys Glu Val
1025 1030 1035 1040

Ser His Leu Ser Ala Leu Glu Glu Arg Phe Ser Arg Leu Trp Thr Gln
1045 1050 1055

Cys Gln Arg Cys Gln Gly Ser Leu His Glu Asp Val Ile Cys Thr Ser
1060 1065 1070

Arg Asp Cys Pro Ile Phe Tyr Met Arg Lys Lys Val Arg Lys Asp Leu
1075 1080 1085

140/236

Glu Asp Gln Glu Arg Leu Leu Arg Arg Phe Gly Pro Pro Gly Pro Glu
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Ala Trp
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 <211> 3457
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 <213> *Drosophila melanogaster*

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141/236

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142/236

<211> 1092

<212> PRT

<213> *Drosophila melanogaster*

<400> 64

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 35 40 45

Gly Asp Gly Pro Glu Asn Gln Thr Thr Ser Glu Arg Trp Ser Arg Pro
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Pro Pro Pro Glu Leu Asp Pro Ser Lys His Asn Leu Glu Phe Gln Gln
 65 70 75 80

Leu Asp Val Glu Asn Tyr Leu Gly Gln Pro Leu Pro Gly Met Pro Gly
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Ala Gln Ile Gly Pro Val Pro Val Val Arg Met Phe Gly Val Thr Met
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Glu Gly Asn Ser Val Cys Cys His Val His Gly Phe Cys Pro Tyr Phe
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Tyr Ile Glu Ala Pro Ser Gln Phe Glu Glu His His Cys Glu Lys Leu
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Gln Lys Ala Leu Asp Gln Lys Val Ile Ala Asp Ile Arg Asn Asn Lys
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Asp Asn Val Gln Glu Ala Val Leu Met Val Glu Leu Val Glu Lys Leu
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143/236

Asn Ile His Gly Tyr Asn Gly Asp Lys Lys Gln Arg Tyr Ile Lys Ile
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Ser Val Thr Leu Pro Arg Phe Val Ala Ala Ala Ser Arg Leu Leu Lys
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Lys Glu Val Ile Met Ser Glu Ile Asp Phe Gln Asp Cys Arg Ala Phe
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Glu Asn Asn Ile Asp Phe Asp Ile Arg Phe Met Val Asp Thr Asp Val
225 230 235 240

Val Gly Cys Asn Trp Ile Glu Leu Pro Met Gly His Trp Arg Ile Arg
245 250 255

Asn Ser His Ser Lys Pro Leu Pro Glu Ser Arg Cys Gln Ile Glu Val
260 265 270

Asp Val Ala Phe Asp Arg Phe Ile Ser His Glu Pro Glu Gly Glu Trp
275 280 285

Ser Lys Val Ala Pro Phe Arg Ile Leu Ser Phe Asp Ile Glu Cys Ala
290 295 300

Gly Arg Lys Gly Ile Phe Pro Glu Ala Lys Ile Asp Pro Val Ile Gln
305 310 315 320

Ile Ala Asn Met Val Ile Arg Gln Gly Glu Arg Glu Pro Phe Ile Arg
325 330 335

Asn Val Phe Thr Leu Asn Glu Cys Ala Pro Ile Ile Gly Ser Gln Val
340 345 350

Leu Cys His Asp Lys Glu Thr Gln Met Leu Asp Lys Trp Ser Ala Phe
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Val Arg Glu Val Asp Pro Asp Ile Leu Thr Gly Tyr Asn Ile Asn Asn
370 375 380

Phe Asp Phe Pro Tyr Leu Leu Asn Arg Ala Ala His Leu Lys Val Arg
385 390 395 400

Asn Phe Glu Tyr Leu Gly Arg Ile Lys Asn Ile Arg Ser Val Ile Lys
405 410 415

Glu Gln Met Leu Gln Ser Lys Gln Met Gly Arg Arg Glu Asn Gln Tyr
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Val Asn Phe Glu Gly Arg Val Pro Phe Asp Leu Leu Phe Val Leu Leu
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Arg Asp Tyr Lys Leu Arg Ser Tyr Thr Leu Asn Ala Val Ser Tyr His
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Phe Leu Gln Glu Gln Lys Glu Asp Val His His Ser Ile Ile Thr Asp
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Leu Gln Asn Gly Asp Glu Gln Thr Arg Arg Arg Ser Ala Met Tyr Cys
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Leu Lys Asp Ala Tyr Leu Pro Leu Arg Leu Leu Glu Lys Leu Met Ala
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Ile Val Asn Tyr Met Glu Met Ala Arg Val Thr Gly Val Pro Leu Glu
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Arg Lys Ala Lys Thr Lys Gly Phe Ile Met Pro Ser Tyr Thr Ser Gln
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Gly Ser Asp Glu Gln Tyr Glu Gly Ala Thr Val Ile Glu Pro Lys Arg

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Pro Ser Ile Met Met Ala His Asn Leu Cys Tyr Thr Thr Leu Val Leu		
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Gly Gly Thr Arg Glu Lys Leu Arg Gln Gln Glu Asn Leu Gln Asp Asp		
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Gln Val Glu Arg Thr Pro Ala Asn Asn Tyr Phe Val Lys Ser Glu Val		
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Arg Arg Gly Leu Leu Pro Glu Ile Leu Glu Ser Leu Leu Ala Ala Arg		
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Lys Arg Ala Lys Asn Asp Leu Lys Val Glu Thr Asp Pro Phe Lys Arg		
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Val Tyr Gly Phe Thr Gly Ala Gln Val Gly Lys Leu Pro Cys Leu Glu		
690	695	700
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705	710	715
Lys Asn Glu Val Glu Ser His Tyr Thr Gln Ala Asn Gly Tyr Glu Asn		
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Asn Ala Val Val Ile Tyr Gly Asp Thr Asp Ser Val Met Val Asn Phe		
740	745	750
Gly Val Lys Thr Leu Glu Arg Ser Met Glu Leu Gly Arg Glu Ala Ala		
755	760	765

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Glu Leu Val Ser Ser Lys Phe Val His Pro Ile Lys Leu Glu Phe Glu
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Lys Val Tyr Tyr Pro Tyr Leu Leu Ile Asn Lys Lys Arg Tyr Ala Gly
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Leu Tyr Phe Thr Arg Pro Asp Thr Tyr Asp Lys Met Asp Cys Lys Gly
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Ile Glu Thr Val Arg Arg Asp Asn Ser Pro Leu Val Ala Asn Leu Met
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Asn Ser Cys Leu Gln Lys Leu Leu Ile Glu Arg Asp Pro Asp Gly Ala
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Val Ala Tyr Val Lys Gln Val Ile Ala Asp Leu Leu Cys Asn Arg Ile
850 855 860

Asp Ile Ser His Leu Val Ile Thr Lys Glu Leu Ala Lys Thr Asp Tyr
865 870 875 880

Ala Ala Lys Gln Ala His Val Glu Leu Ala Ala Lys Met Lys Lys Arg
885 890 895

Asp Pro Gly Thr Ala Pro Lys Leu Gly Asp Arg Val Pro Tyr Val Ile
900 905 910

Cys Ala Ala Ala Lys Asn Thr Pro Ala Tyr Gln Lys Ala Glu Asp Pro
915 920 925

Leu Tyr Val Leu Glu Asn Ser Val Pro Ile Asp Ala Thr Tyr Tyr Leu
930 935 940

Glu Gln Gln Leu Ser Lys Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu
945 950 955 960

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Gly Asp Asn Ala Glu Ser Ile Leu Leu Lys Gly Glu His Thr Arg Thr
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Arg Thr Val Val Thr Ser Lys Val Gly Gly Leu Ala Gly Phe Met Thr
 980 985 990

Lys Lys Thr Ser Cys Leu Gly Cys Lys Ser Leu Met Pro Lys Gly Tyr
 995 1000 1005

Glu Gln Ala Cys Leu Cys Pro His Cys Glu Pro Arg Met Ser Glu Leu
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Val Ile Cys Ser Asn Arg Asp Cys Pro Ile Phe Tyr Met Arg Gln Lys
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Leu Ala Glu Trp
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<212> DNA

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 caaatcaaaa acacacacag gtttatgtt gcggagatg tatgcacag agagcgcgga 180

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 cagaaaaaagg goaatagat tccggataac aaaaacttgat ggcgttcccg attttcccg 360
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gott 9084

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Asp Arg Val Lys Asp Ser Gln Glu Arg Thr Gly Tyr Leu Ile Asn Met
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His Ser Asn Glu Val Leu Asp Glu Asp Arg Arg Leu Ile Ala Ala Leu
65 70 75 80
Asp Leu Phe Phe Ile Gln Met Asp Gly Ser Arg Phe Lys Cys Thr Val
85 90 95
Ala Tyr Gln Pro Tyr Leu Leu Ile Arg Pro Glu Asp Asn Met His Leu
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Glu Val Ala Arg Phe Leu Gly Arg Lys Tyr Ser Gly Gln Ile Ser Gly
115 120 125
Leu Glu His Ile Thr Lys Glu Asp Leu Asp Leu Pro Asn His Leu Ser
130 135 140

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Gly Leu Gln Gln Gln Tyr Ile Lys Leu Ser Phe Leu Asn Gln Thr Ala
145 160 155 160

Met Thr Lys Val Arg Arg Glu Leu Met Ser Ala Val Lys Arg Asn Gln
165 170 175

Glu Arg Gln Lys Ser Asn Thr Tyr Tyr Met Gln Met Leu Ala Thr Ser
180 185 190

Leu Ala Gln Ser Ser Ala Gly Ser Glu Asp Ala Thr Leu Gly Lys Arg
195 200 205

Gln Gln Asp Tyr Met Asp Cys Ile Val Asp Ile Arg Glu His Asp Val
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Pro Tyr His Val Arg Val Ser Ile Asp Leu Arg Ile Phe Cys Gly Gln
225 230 235 240

Trp Tyr Asn Ile Arg Cys Arg Ser Gly Val Glu Leu Pro Thr Ile Thr
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Cys Arg Pro Asp Ile Leu Asp Arg Pro Glu Pro Val Val Leu Ala Phe
260 265 270

Asp Ile Glu Thr Thr Lys Leu Pro Leu Lys Phe Pro Asp Ala Gln Thr
275 280 285

Asp Gln Val Met Met Ile Ser Tyr Met Ile Asp Gly Gln Gly Tyr Leu
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Ile Thr Asn Arg Glu Ile Ile Ser Ser Asn Val Asp Asp Phe Glu Tyr
305 310 315 320

Thr Pro Lys Pro Glu Phe Glu Gly Asn Phe Ile Val Phe Asn Glu Glu
325 330 335

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Asn Glu Met Gln Leu Leu Gln Arg Phe Phe Asp His Ile Met Glu Val
340 345 350

Arg Pro His Ile Ile Val Thr Tyr Asn Gly Asp Phe Phe Asp Trp Pro
355 360 365

Phe Val Glu Thr Arg Ala Ala Val Tyr Asp Leu Asp Met Lys Gln Glu
370 375 380

Ile Gly Phe Ser Lys Leu Arg Asp Gly Asn Tyr Leu Ser Arg Pro Ala
385 390 395 400

Ile His Met Asp Cys Leu Cys Trp Val Lys Arg Asp Ser Tyr Leu Pro
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Asp Pro Val Glu Leu Asp Pro Glu Asp Met Cys Arg Met Ala Val Glu
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Gln Pro Gln Val Leu Ala Asn Tyr Ser Val Ser Asp Ala Val Ala Thr
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Thr Ile Ile Pro Met Glu Pro Asp Glu Ile Leu Arg Lys Gly Ser Gly
485 490 495

Thr Leu Cys Glu Thr Leu Leu Met Val Glu Ala Tyr His Ala Gln Ile
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Val Tyr Pro Asn Lys His Gln Ser Glu Leu Asn Lys Leu Ser Asn Glu
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Gly His Val Leu Asp Ser Glu Thr Tyr Val Gly Gly His Val Glu Ala

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His Asp Ile Pro Asn Arg Leu Glu Gln Pro Val Ile Tyr His Leu Asp		
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Ser Ala Met Val Ser Asp Leu Asp Cys Ala Ala Cys Asp Phe Asn Lys		
645	650	655
Pro Gly Val Arg Cys Lys Arg Ser Met Asp Trp Leu Trp Arg Gly Glu		
660	665	670
Met Leu Pro Ala Ser Arg Asn Glu Phe Gln Arg Ile Gln Gln Gln Leu		
675	680	685
Glu Thr Glu Lys Phe Pro Pro Leu Phe Pro Gly Gly Pro Gln Arg Ala		
690	695	700
Phe His Glu Leu Ser Lys Glu Asp Gln Ala Ala Tyr Glu Lys Lys Arg		
705	710	715 720
Leu Thr Asp Tyr Cys Arg Lys Ala Tyr Lys Lys Thr Lys Leu Thr Lys		

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725	730	735
Leu Glu Thr Arg Thr Ser Thr Ile Cys Gln Lys Glu Asn Ser Phe Tyr		
740	745	750
Val Asp Thr Val Arg Ala Phe Arg Asp Arg Arg Tyr Glu Tyr Lys Gly		
755	760	765
Leu Thr Lys Val Ala Lys Ala Ser Val Asn Ala Ala Val Ala Ser Gly		
770	775	780
Asp Ala Ala Glu Ile Lys Ala Ala Lys Gly Arg Glu Val Leu Tyr Asp		
785	790	795 800
Ser Leu Gln Leu Ala His Lys Cys Ile Leu Asn Ser Phe Tyr Gly Tyr		
805	810	815
Val Met Arg Arg Gly Ala Arg Trp His Ser Met Pro Met Ala Gly Ile		
820	825	830
Val Cys Leu Thr Gly Ser Asn Ile Ile Thr Lys Ala Arg Glu Ile Ile		
835	840	845
Glu Arg Val Gly Arg Pro Leu Glu Leu Asp Thr Asp Gly Ile Trp Cys		
850	855	860
Ile Leu Pro Gly Ser Phe Pro Gln Glu Phe Thr Ile His Thr Ser His		
865	870	875 880
Glu Lys Lys Lys Lys Ile Asn Ile Ser Tyr Pro Asn Ala Val Leu Asn		
885	890	895
Thr Met Val Lys Asp His Phe Thr Asn Asp Gln Tyr His Glu Leu Arg		
900	905	910
Lys Asp Lys Glu Asn Asn Leu Pro Lys Tyr Asp Ile Arg Asp Glu Asn		
915	920	925

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Ser Ile Phe Phe Glu Val Asp Gly Pro Tyr Leu Ala Met Val Leu Pro
930 935 940

Ala Ala Lys Glu Glu Gly Lys Lys Leu Lys Lys Arg Tyr Ala Val Phe
945 950 955 960

Asn Phe Asp Gly Thr Leu Ala Glu Leu Lys Gly Phe Glu Val Lys Arg
965 970 975

Arg Gly Glu Leu Gln Leu Ile Lys Asn Phe Gln Ser Ser Val Phe Glu
980 985 990

Ala Phe Leu Ala Gly Ser Thr Leu Glu Glu Cys Tyr Ala Ser Val Ala
995 1000 1005

Lys Val Ala Asp Tyr Trp Leu Asp Val Leu Tyr Ser Arg Gly Ser Asn
1010 1015 1020

Leu Pro Asp Ser Glu Leu Phe Glu Leu Ile Ser Glu Asn Lys Ser Met
1025 1030 1035 1040

Ser Lys Lys Leu Glu Glu Tyr Gly Ala Gln Lys Ser Thr Ser Ile Ser
1045 1050 1055

Thr Ala Lys Arg Leu Ala Glu Phe Leu Gly Glu Gln Met Val Lys Asp
1060 1065 1070

Ala Gly Leu Ala Cys Lys Tyr Ile Ile Ser Lys Lys Pro Glu Gly Ala
1075 1080 1085

Pro Val Thr Glu Arg Ala Ile Pro Leu Ala Ile Phe Gln Ser Glu Pro
1090 1095 1100

Ser Val Arg Arg His His Leu Arg Arg Trp Leu Lys Asp Asn Thr Met
1105 1110 1115 1120

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Gly Asp Ala Asp Ile Arg Asp Val Leu Asp Trp Asn Tyr Tyr Ile Glu
1125 1130 1135

Arg Leu Gly Gly Thr Ile Gln Lys Ile Ile Thr Ile Pro Ala Ala Leu
1140 1145 1150

Gln Gly Leu Ala Asn Pro Val Pro Arg Val Gln His Pro Asp Trp Leu
1155 1160 1165

His Lys Lys Met Leu Glu Lys Asn Asp Val Leu Lys Gln Arg Arg Ile
1170 1175 1180

Asn Glu Met Phe Thr Ser Arg Pro Lys Pro Lys Pro Leu Ala Thr Glu
1185 1190 1195 1200

Glu Asp Lys Leu Ala Asp Met Glu Asp Leu Ala Gly Lys Asp Gly Gly
1205 1210 1215

Glu Gly Ala Ala Gly Cys Pro Ile Val Thr Lys Arg Lys Arg Ile Gln
1220 1225 1230

Leu Glu Glu His Asp Glu Glu Glu Ala Gln Pro Gln Ala Thr Thr Trp
1235 1240 1245

Arg Gln Ala Leu Gly Ala Pro Pro Pro Ile Gly Glu Thr Arg Lys Thr
1250 1255 1260

Ile Val Glu Trp Val Arg Phe Gln Lys Lys Lys Trp Lys Trp Gln Gln
1265 1270 1275 1280

Asp Gln Arg Gln Arg Asn Arg Gln Ala Ser Lys Arg Thr Arg Gly Glu
1285 1290 1295

Asp Pro Arg Tyr Thr Gly Arg Phe Leu Arg Arg Ala Gln Arg Thr Leu
1300 1305 1310

Leu Asp Gln Pro Trp Gln Ile Val Gln Leu Val Pro Val Asp Asp Leu

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1315	1320	1325
Gly His Phe Thr Val Trp Ala Leu Ile Gly Glu Glu Leu His Lys Ile		
1330	1335	1340
Lys Leu Thr Val Pro Arg Ile Phe Tyr Val Asn Gln Arg Ser Ala Ala		
1345	1350	1355 1360
Pro Pro Glu Glu Gly Gln Leu Trp Arg Lys Val Asn Arg Val Leu Pro		
1365	1370	1375
Arg Ser Arg Pro Val Phe Asn Leu Tyr Arg Tyr Ser Val Pro Glu Gln		
1380	1385	1390
Leu Phe Arg Asp Asn Ser Leu Gly Met Leu Ala Asp Leu Ala Thr Pro		
1395	1400	1405
Asp Ile Glu Gly Ile Tyr Glu Thr Gln Met Thr Leu Glu Phe Arg Ala		
1410	1415	1420
Leu Met Asp Met Gly Cys Ile Cys Gly Val Gln Arg Glu Glu Ala Arg		
1425	1430	1435 1440
Arg Leu Ala Gln Leu Ala Thr Lys Asp Leu Glu Thr Phe Ser Ile Glu		
1445	1450	1455
Gln Leu Glu Gln Gly Pro Arg Leu Arg Ser Asn Ile Trp Leu Ala Pro		
1460	1465	1470
Thr Ile Asp Cys Ala Lys Ser Thr Cys Ile Ser Ile Thr His Arg Arg		
1475	1480	1485
Pro Arg Arg Arg Ser Val Ser Leu Ile Pro Met Pro Ser Lys Lys Ala		
1490	1495	1500
Phe Val Phe Ala Leu Asp Thr Val Arg Ala Asn Gln Met Pro Asn Met		
1505	1510	1515 1520

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Arg Gln Leu Tyr Thr Ala Glu Arg Leu Ala Leu Leu Lys Asn Leu Thr
1525 1530 1535

Ala Glu Glu Gln Asp Lys Ile Pro Val Glu Asp Tyr Thr Phe Glu Val
1540 1545 1550

Leu Ile Glu Val Asp Val Lys Gln Ile Tyr Arg His Ile Gln Arg Ala
1555 1560 1565

Leu Thr Thr Tyr Lys Gln Glu His Gln Gly Pro Pro Thr Ile Leu Gys
1570 1575 1580

Leu Gln Thr Ala Leu Ser Ala Arg Lys Leu Ser Leu Ala Met Pro Ile
1585 1590 1595 1600

Leu Leu Glu Phe Pro Gln Ala Gln Ile His Ile Ser Asp Asp Ala Ser
1605 1610 1615

Leu Leu Ser Gly Leu Asp Trp Gln Arg Gln Gly Ser Arg Ala Val Ile
1620 1625 1630

Arg His Phe Leu Asn Leu Asn Asn Val Leu Asp Leu Met Leu Asp Gln
1635 1640 1645

Cys Arg Tyr Phe His Val Pro Ile Gly Asn Met Pro Pro Asp Thr Val
1650 1655 1660

Leu Phe Gly Ala Asp Leu Phe Phe Ala Arg Leu Leu Gln Arg His Asn
1665 1670 1675 1680

Phe Val Leu Trp Trp Ser Ala Ser Thr Arg Pro Asp Leu Gly Gly Arg
1685 1690 1695

Glu Ala Asp Asp Ser Arg Leu Leu Ala Glu Phe Glu Glu Ser Ile Ser
1700 1705 1710

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Val Val Gln Asn Lys Ala Gly Phe Tyr Pro Asp Val Cys Val Glu Leu
1715 1720 1725

Ala Leu Asp Ser Leu Ala Val Ser Ala Leu Leu Gln Ser Thr Arg Ile
1730 1735 1740

Gln Glu Met Glu Gly Ala Ser Ser Ala Ile Thr Phe Asp Val Met Pro
1745 1750 1755 1760

Gln Val Ser Leu Glu Glu Met Ile Gly Thr Val Pro Ala Ala Thr Leu
1765 1770 1775

Pro Ser Tyr Asp Glu Thr Ala Leu Cys Ser Ala Ala Phe Arg Val Met
1780 1785 1790

Arg Ser Met Val Asn Gly Trp Leu Arg Glu Val Ser Ile Asn Arg Asn
1795 1800 1805

Ile Phe Ser Asp Phe Gln Ile Val His Phe Tyr Arg Trp Val Arg Ser
1810 1815 1820

Ser Asn Ala Leu Leu Tyr Asp Pro Ala Leu Arg Arg Ser Leu Asn Asn
1825 1830 1835 1840

Leu Met Arg Lys Met Phe Leu Arg Ile Ile Ala Glu Phe Lys Arg Leu
1845 1850 1855

Gly Ala Thr Ile Ile Tyr Ala Asp Phe Asn Arg Ile Ile Leu Ser Ser
1860 1865 1870

Gly Lys Lys Thr Val Ser Asp Ala Leu Gly Tyr Val Asp Tyr Ile Val
1875 1880 1885

Gln Ser Leu Arg Asn Lys Glu Met Phe His Ser Ile Gln Leu Ser Phe
1890 1895 1900

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Glu Gln Cys Trp Asn Phe Met Leu Trp Met Asp Gln Ala Asn Phe Ser
 1905 1910 1915 1920

Gly Ile Arg Gly Lys Leu Pro Lys Gly Ile Asp Glu Thr Val Ser Ser
 1925 1930 1935

Ile Val Ser Thr Thr Met Ile Arg Asp Ser Glu Arg Asn Gln Asp Asp
 1940 1945 1950

Asp Glu Asp Glu Glu Glu Asp Ser Glu Asn Arg Asp Pro Val Glu Ser
 1955 1960 1965

Asn Glu Ala Glu Gln Asp Gln Glu Asp Glu Leu Ser Leu Glu Leu Asn
 1970 1975 1980

Trp Thr Ile Gly Glu His Leu Pro Asp Glu Asn Glu Cys Arg Glu Lys
 1985 1990 1995 2000

Phe Glu Ser Leu Leu Thr Leu Phe Met Gln Ser Leu Ala Glu Lys Lys
 2005 2010 2015

Thr Thr Glu Gln Ala Ile Lys Asp Ile Ser His Cys Ala Phe Asp Phe
 2020 2025 2030

Ile Leu Lys Leu His Lys Asn Tyr Gly Lys Gly Lys Pro Ser Pro Gly
 2035 2040 2045

Leu Glu Leu Ile Arg Thr Leu Ile Lys Ala Leu Ser Val Asp Lys Thr
 2050 2055 2060

Leu Ala Glu Gln Ile Asn Glu Leu Arg Arg Asn Met Leu Arg Leu Val
 2065 2070 2075 2080

Gly Ile Gly Glu Phe Ser Asp Leu Ala Glu Trp Glu Asp Pro Cys Asp
 2085 2090 2095

Ser His Ile Ile Asn Glu Val Ile Cys Lys Ala Cys Asn His Cys Arg

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2100	2105	2110
Asp Leu Asp Leu Cys Lys Asp Lys His Arg Ala Met Lys Asp Gly Cys		
2115	2120	2125
Tyr Val Ala Tyr Asp Asn Glu Glu Ile Glu Met Arg Met Leu Asp Ala		
2130	2135	2140
Leu Gln Arg Lys Met Met Ser Tyr Val Leu Gln Asp Leu Arg Cys Ser		
2145	2150	2155
		2160
Arg Cys Ser Glu Ile Lys Arg Glu Asn Leu Ala Glu Phe Cys Thr Cys		
2165	2170	2175
Ala Gly Asn Phe Val Pro Leu Ile Ser Gly Lys Asp Ile Gln Thr Leu		
2180	2185	2190
Leu Gly Thr Phe Asn Lys Val Ala Ala Asn His Lys Met Gln Leu Leu		
2195	2200	2205
Gln Gln Thr Val His Gln Ala Leu Thr Thr Pro Arg		
2210	2215	2220

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28

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 <223> primer

<400> 68
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26

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 <223> primer

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24

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 <213> Mus musculus

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gaggaaatag aggtcagaa cggctgcag gaggcagag aggagctga gctgccccca 180

gaggcaccg tggctggga gtttcact gcagacattg accctgggtg gcggcgccc 240

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<212> DNA

<213> Artificial Sequence

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<220>

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<220>

<223> primer

<400> 72

ggactagtat ggtatgcaca acagcoto

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<210> 73

<211> 29

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<223> primer

<400> 73

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29

<210> 74

<211> 28

<212> DNA

<213> Artificial Sequence

169/236

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<400> 75

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18

<210> 76

<211> 21

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<210> 77

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170/236

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171/236

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ttttgataca tatgcagota gactcaagag ctccgggcta ctggttagtt cataatgttg 660

atccacotat agggttgag atcccttag ctcttgggt actttctota gotcctocat 720

tgggagcoot gtatocato cattagctga ctgtgggcac caactctgt gtttgotagg 780

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 ttccattagg tccatttgt caattctga tottacagca caagccattg ctgtttctgt 1920

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gggcagtg tacatgggt ttctcagta acagtttct ctgggaaga gatagatt 3960
ccaggttctt aaaaactgt tttctgtao atcctaagt aattttcaa ttgaaaca 4020
aacaatagt aagctotgt tgtgtgtt gataagtagc aaattaattt agggggagca 4080

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gtttggggg ctgatgggc ttgtttgcc attcaggctg ggcgaagct cotagggtot 4140
 gaagatgctc ctgttcaga ctocaaagca tgggactgca tcaagaagcg tgcacacgtg 4200
 ctaggcttcc aatcaggttt cacattttgc ttotagacag aatataatt tootgaaac 4260
 ttctgtttg aatgatgtc attattggc ccccgacac attgtgtgtg acgccccct 4320
 cccactatcc ctgagctga aatgtcctga ttgggtgca agctcattt gaactgatg 4380
 tccccotta atccctggag ctgaatgtc ctgattgggt gccaaaattt tttoactga 4440
 tgoototccc atccattag caotaggact gaagtgtat gattggcgc aaaaactaat 4500
 ttcaattat gcccggcccc tccattatc cctagtgtg agatgtcatg attggggcca 4560
 acactcattt ctgtgatgg cctctctc ccattagacc tggacotgaa toogtgtat 4620
 gattggacgc caacactcat ttcaatgat gcccggcccc tccattagt cctgagctg 4680
 aacccctgtc atgattgggc tcaactctc atttcagtg atgtcagct cctcccatca 4740
 gccctgtgc tgaatctctg tcacgattgg gcccacccc tcattttctg tgaggcccag 4800
 cccctcccat tagccctggg gtgtcatccc tctccact agaaacacac actcatttct 4860
 gtgtatgccc cggccatgac attacccttg ggcctaaac cctgtcatga ttgaactcca 4920
 accacattt ctctgatac ctgactccc attatcotta ggcctaatcc gtgtcataat 4980
 tggggccaa caotgattt ctctgatgc ctgcccctcc cattagccc ggcctgaac 5040
 ctgtcataa ttggacttga accctcattt ttgtgaggc ccagggctc ccatttgtcc 5100
 tgggtgat cctgtcatg attgggccc aacccctatt tgggtgagg cccactct 5160
 ccaattagcc ctgaggctga atcatgtca tgagtggca ccaactcaca ttaacatga 5220

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tgcgctgccc cttacattag cctggggct gaatootgt catgatiggg ccccaaacct 5280
 catttatgt gatggccto ctotcccatt agacotgagg ctgaatcgt gtoatgattg 5340
 ggcaaccaac cgcattcca ctasagccc aocootccca ttacatcct gccgaacca 5400
 tcttttgtca tgattgggc ccaacccctc ttccactga tgccccccc toocttaago 5460
 cotootgtg agaccacato ttgattgggc actaacato attcogotg atgcccacca 5520
 ctocatttg cctgggaat taacccctgt cgtgattggg tctcaacct catttcoggt 5580
 gatgccccgc ctcttctat aaatcctggc gtcasatac tctgctgggt gggcaggaa 5640
 agccatttg atcactgct gcagootago ggttagotg ctctgggat catctgttt 5700
 gagtaotit gggactgtg gactg 5725

<210> 82
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 82
 ctgagttag attcccgcc atggaatcg

30

<210> 83
 <211> 30
 <212> DNA
 <213> Artificial Sequence

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<220>

<223> primer

<400> 83

agcaacgagc tottatgatt ggtttatctg

30

<210> 84

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 84

atttgctgto gataatatca gatttcttgg

30

<210> 85

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 85

gagtggagat ttgtacatga totgaagg

28

<210> 86

<211> 3357

<212> DNA

<213> Mus musculus

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<220>

<221> CDS

<222> (24).. (3341)

<400> 86

~~gscagg~~aaaa gctgtttgag gcg atg gat tgt aag cgg cga caa gga cca ggc 53

Met Asp Cys Lys Arg Arg Gln Gly Pro Gly

1 5 10

cct ggg gtg ccc oca aag ogg gct cga ggg cac ctc tgg gat gag gao 101

Pro Gly Val Pro Pro Lys Arg Ala Arg Gly His Leu Trp Asp Glu Asp

15 20 25

gag cct tcg ccg tcg cag ttt gag gag aac ctg gca ctg ctg gag gaa 149

Glu Pro Ser Pro Ser Gln Phe Glu Ala Asn Leu Ala Leu Leu Glu Glu

30 35 40

ata gag gct gag aac cgg ctg cag gag gca gag gag gag ctg cag ctg 197

Ile Glu Ala Glu Asn Arg Leu Gln Glu Ala Glu Glu Glu Leu Gln Leu

45 50 55

ccc oca gag ggc aac gtg ggt ggg cag ttt too act gca gac att gac 245

Pro Pro Glu Gly Thr Val Gly Gly Gln Phe Ser Thr Ala Asp Ile Asp

60 65 70

cct cgg tgg cgg cgg ccc acc cta cgt ggc ctg gao ccc ago aag gag 293

Pro Arg Trp Arg Arg Pro Thr Leu Arg Ala Leu Asp Pro Ser Thr Glu

75 80 85 90

ccc cta atc ttc cag cag ctg gag att gac cac tat gtg ggc tca gca 341

Pro Leu Ile Phe Gln Gln Leu Glu Ile Asp His Tyr Val Gly Ser Ala

95 100 105

cca ccc ctg cca gaa ggg ccc ctg cca tcc cgg aac tca gtg ccc ata 389

Pro Pro Leu Pro Glu Gly Pro Leu Pro Ser Arg Asn Ser Val Pro Ile

110 115 120

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otg agg gcc ttt ggg gto acc gat gaa ggc tto too gto tgo tgo cac Leu Arg Ala. Phe Gly Val Thr Asp Glu Gly Phe Ser Val Cys Cys His 125 130 135	437
ata cag ggc ttt gcc oco tac ttc tac acc ccc ggc cct cct ggt ttt Ile Gln Gly Phe Ala Pro Tyr Phe Tyr Thr Pro Ala Pro Pro Gly Phe 140 145 150	485
ggg gcc gag cac otg agt gag otg cag cag gag otg aac gca gcc atc Gly Ala Glu His Leu Ser Glu Leu Gln Gln Glu Leu Asn Ala Ala Ile 155 160 165 170	533
agc cgg gac cag cgc ggt ggg aag gag otc toa ggg cag goa gtg otg Ser Arg Asp Gln Arg Gly Gly Lys Glu Leu Ser Gly Pro Ala Val Leu 175 180 185	581
gca ata gag ota tgo too ogt gag agc atg ttt ggg tac cac ggt cat Ala Ile Glu Leu Cys Ser Arg Glu Ser Met Phe Gly Tyr His Gly His 190 195 200	629
ggc cct tot oca ttt otc ogc atc acc ctg gca ota oco ogo ctt atg Gly Pro Ser Pro Phe Leu Arg Ile Thr Leu Ala Leu Pro Arg Leu Met 205 210 215	677
gca oca gcc cgc cgc ctt ctg gaa cag ggt gto oga gtg oca ggc otg Ala Pro Ala Arg Arg Leu Leu Glu Gln Gly Val Arg Val Pro Gly Leu 220 225 230	725
ggc acc cag agc tto gca oco tac gaa gcc aac gtg gac ttt gag atc Gly Thr Pro Ser Phe Ala Pro Tyr Glu Ala Asn Val Asp Phe Glu Ile 235 240 245 250	773
cag ttc atg gtg gat gct gac att gtg gga tgo aac tgg ttg gag ctg Arg Phe Met Val Asp Ala Asp Ile Val Gly Cys Asn Trp Leu Glu Leu 255 260 265	821

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cca got gga aag tac gtt cgg agg gcg gag aag aag gcc acc ctg tgt	869
Pro Ala Gly Lys Tyr Val Arg Arg Ala Glu Lys Lys Ala Thr Leu Cys	
270 275 280	
cag ctg gag gtg gao gtg ctg tgg tca gat gtg atc agt cac cca ccg	917
Gln Leu Glu Val Asp Val Leu Trp Ser Asp Val Ile Ser His Pro Pro	
285 290 295	
gag ggg cag tgg cag cgc att gca ccc ctg cgt gtg ott agc ttc gao	965
Glu Gly Gln Trp Gln Arg Ile Ala Pro Leu Arg Val Leu Ser Phe Asp	
300 305 310	
atc gag tgt got ggo oga aaa ggo atc ttc cct gag cct gag cgt gac	1013
Ile Glu Cys Ala Gly Arg Lys Gly Ile Phe Pro Glu Pro Glu Arg Asp	
315 320 325 330	
ccc gtg atc cag atc tgt tct ctg ggg ctg cgc tgg ggg gag cgg gag	1061
Pro Val Ile Gln Ile Cys Ser Leu Gly Leu Arg Trp Gly Glu Pro Glu	
335 340 345	
cca ttc ttg cgt ctg goa ctg acg ctg cgg ccc tgt gcc ccc atc ctg	1109
Pro Phe Leu Arg Leu Ala Leu Thr Leu Arg Pro Cys Ala Pro Ile Leu	
350 355 360	
ggt gcc aaa gtg cag ago tat gag cgg gaa gaa gac ctg ctg cag gcc	1157
Gly Ala Lys Val Gln Ser Tyr Glu Arg Glu Glu Asp Leu Leu Gln Ala	
365 370 375	
tgg gcc gac ttc atc ctt goo atg gac cct gac gtg atc acc ggc tac	1205
Trp Ala Asp Phe Ile Leu Ala Met Asp Pro Asp Val Ile Thr Gly Tyr	
380 385 390	
aac att cag aac ttt gac ctg cca tac ctg atc tot cgg gca cag gcc	1253
Asn Ile Gln Asn Phe Asp Leu Pro Tyr Leu Ile Ser Arg Ala Gln Ala	
395 400 405 410	
cta aag gtg gao cgc ttc cct ttc ctg ggc cgc gtg act ggt ctg cgc	1301

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Leu Lys Val Asp Arg Phe Pro Phe Leu Gly Arg Val Thr Gly Leu Arg	
415 420 425	
too aac atc cgt gao too too ttc caa tca agg cag gtc ggc ogg ogg	1349
Ser Asn Ile Arg Asp Ser Ser Phe Gln Ser Arg Gln Val Gly Arg Arg	
430 435 440	
gac agt aag gtg atc ago atg gtg ggt ogo gtt cag atg gat atg ctg	1397
Asp Ser Lys Val Ile Ser Met Val Gly Arg Val Gln Met Asp Met Leu	
445 450 455	
cag gtg ctg ctt ogg gaa cac aag ctc ogo too tac aag ctc aac got	1445
Gln Val Leu Leu Arg Glu His Lys Leu Arg Ser Tyr Thr Leu Asn Ala	
460 465 470	
gtg agt ttc cao tto ctg ggc gag cag aag gag gac gtt cag cac ago	1493
Val Ser Phe His Phe Leu Gly Glu Gln Lys Glu Asp Val Gln His Ser	
475 480 485 490	
atc atc aac gac ctg cag aat ggc aao gaa cag aag ogo ogo cgc ctg	1541
Ile Ile Thr Asp Leu Gln Asn Gly Asn Glu Gln Thr Arg Arg Arg Leu	
495 500 505	
gcc gtg tac tgo ctg aag gac ggc ttt ctg oca ctc cga cta cta gag	1589
Ala Val Tyr Cys Leu Lys Asp Ala Phe Leu Pro Leu Arg Leu Leu Glu	
510 515 520	
cgc ctt atg gtg ctg gtg aat aat gtg gag atg gcg cgt gtc aag ggt	1637
Arg Leu Met Val Leu Val Asn Asn Val Glu Met Ala Arg Val Thr Gly	
525 530 535	
gta ccc att gag tac ctg ctc aac ogg ggc cag cag gtc aag gtc gtg	1685
Val Pro Leu Gly Tyr Leu Leu Thr Arg Gly Gln Gln Val Lys Val Val	
540 545 550	
tot cag ctg ctg cgc cag gcc atg ogo cag ggc ctg ctg atg oot gtg	1733
Ser Gln Leu Leu Arg Gln Ala Met Arg Gln Gly Leu Leu Met Pro Val	

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555	560	565	570	
gtg aag acc gag ggc agt gag gac tac aag gga gcc aca gto att gag				1781
Val Lys Thr Glu Gly Ser Glu Asp Tyr Thr Gly Ala Thr Val Ile Glu				
	575	580	585	
ccc ctc aaa ggg tac tat gac gtc ccc att gcc aac ctg gac ttc too				1829
Pro Leu Lys Gly Tyr Tyr Asp Val Pro Ile Ala Thr Leu Asp Phe Ser				
	590	595	600	
too ttg tac cca toc atc atg atg gcc cat aat ctg tgc tac acc acc				1877
Ser Leu Tyr Pro Ser Ile Met Met Ala His Asn Leu Cys Tyr Thr Thr				
	605	610	615	
ctg ctc cga cct ggg gct gcc cag aag ctg ggc ott aaa cca gat gag				1925
Leu Leu Arg Pro Gly Ala Ala Gln Lys Leu Gly Leu Lys Pro Asp Glu				
	620	625	630	
tto atc aag aca ccc act ggg gat gag ttt gtg aag toa tot gta cgg				1973
Phe Ile Lys Thr Pro Thr Gly Asp Glu Phe Val Lys Ser Ser Val Arg				
	635	640	645	650
aag ggc ctc ctg ccc cag atc ctg gag aat ctg ctg agt gcc cgc aag				2021
Lys Gly Leu Leu Pro Gln Ile Leu Glu Asn Leu Leu Ser Ala Arg Lys				
	655	660	665	
agg gcc aag gct gag ctg gct cag gag aag gac ccc ctg cgg aga cag				2069
Arg Ala Lys Ala Glu Leu Ala Gln Glu Thr Asp Pro Leu Arg Arg Gln				
	670	675	680	
gto ttg gac ggc cgg caa ctg gca cta aaa gtg agt gcc aac too gta				2117
Val Leu Asp Gly Arg Gln Leu Ala Leu Lys Val Ser Ala Asn Ser Val				
	685	690	695	
tat ggc tto act agt gcc cag gtg ggc aag ctg cca tgt ttg gag atc				2165
Tyr Gly Phe Thr Gly Ala Gln Val Gly Lys Leu Pro Cys Leu Glu Ile				
	700	705	710	

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too	cag	agt	gtc	act	ggg	ttc	ggg	cag	atg	att	gag	aaa	acc	aag	2213	
Ser	Gln	Ser	Val	Thr	Gly	Phe	Gly	Arg	Gln	Met	Ile	Glu	Lys	Thr	Lys	
715					720				725					730		
cag	ctt	gtg	gag	too	aag	tac	acc	gtg	gaa	aat	ggc	tac	gat	gcc	aac	2261
Gln	Leu	Val	Glu	Ser	Lys	Tyr	Thr	Val	Glu	Asn	Gly	Tyr	Asp	Ala	Asn	
					735				740					745		
gco	aag	gta	gtc	tac	ggt	gac	acc	gao	tot	gtg	atg	tgc	egg	ttt	ggc	2309
Ala	Lys	Val	Val	Tyr	Gly	Asp	Thr	Asp	Ser	Val	Met	Cys	Arg	Phe	Gly	
					750				755					760		
gtc	too	tot	gtg	got	gaa	goa	atg	tot	ctg	ggg	egg	gag	gct	goa	aa	2357
Val	Ser	Ser	Val	Ala	Glu	Ala	Met	Ser	Leu	Gly	Arg	Glu	Ala	Ala	Asn	
					765				770					775		
tgg	gta	too	agt	cac	tto	oca	toa	ooo	ato	egg	ctg	gag	tto	gag	aag	2405
Trp	Val	Ser	Ser	His	Phe	Pro	Ser	Pro	Ile	Arg	Leu	Glu	Phe	Glu	Lys	
					780				785					790		
gtt	tac	tto	oca	tac	ctg	ctc	atc	agc	aag	aag	ogo	tat	got	ggc	ctg	2453
Val	Tyr	Phe	Pro	Tyr	Leu	Leu	Ile	Ser	Lys	Lys	Arg	Tyr	Ala	Gly	Leu	
795					800				805					810		
oto	tto	too	too	ogo	tot	gat	goc	cat	gac	aaa	atg	gac	tgc	aag	ggc	2501
Leu	Phe	Ser	Ser	Arg	Ser	Asp	Ala	His	Asp	Lys	Met	Asp	Cys	Lys	Gly	
					815				820					825		
ctg	gag	got	gtg	ggc	agg	gac	aac	tgt	ccc	ctg	gtg	gcc	aac	ctc	gtt	2549
Leu	Glu	Ala	Val	Arg	Arg	Asp	Asn	Cys	Pro	Leu	Val	Ala	Asn	Leu	Val	
					830				835					840		
aca	too	tot	ctg	ggc	agg	atc	ctc	gtg	gao	egg	gac	oct	gat	ggg	goa	2597
Thr	Ser	Ser	Leu	Arg	Arg	Ile	Leu	Val	Asp	Arg	Asp	Pro	Asp	Gly	Ala	
					845				850					855		

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gta gcc cat gcc aag gac gtc atc tgg gao ctg ctg tgo aac cgo ata	2645
Val Ala His Ala Lys Asp Val Ile Ser Asp Leu Leu Cys Asn Arg Ile	
860 865 870	
gac atc too cag ctg gto ato aac aaa gag ttg acc cgc gca gca gca	2693
Asp Ile Ser Gln Leu Val Ile Thr Lys Glu Leu Thr Arg Ala Ala Ala	
875 880 885 890	
gac tat gct ggc aag cag gct oao gtg gag ctg gct gag agg atg agg	2741
Asp Tyr Ala Gly Lys Gln Ala His Val Glu Leu Ala Glu Arg Met Arg	
895 900 905	
aag cgo gao ooo ggc agt gca ccc agc ctg ggt gac oga gto ccc tat	2789
Lys Arg Asp Pro Gly Ser Ala Pro Ser Leu Gly Asp Arg Val Pro Tyr	
910 915 920	
gtg atc att ggt gct gct aag ggt gtg goo goo tac atg aag tgg gag	2837
Val Ile Ile Gly Ala Ala Lys Gly Val Ala Ala Tyr Met Lys Ser Glu	
925 930 935	
gao ccc ctg ttt gtg ctg gag cac agc ctg ccc atc gao act cag tac	2885
Asp Pro Leu Phe Val Leu Glu His Ser Leu Pro Ile Asp Thr Gln Tyr	
940 945 950	
tac ctg gag cag cag ctg gcc aag oag ctc ttg cgc atc ttt gag ooc	2933
Tyr Leu Glu Gln Gln Leu Ala Lys Pro Leu Leu Arg Ile Phe Glu Pro	
955 960 965 970	
atc ctg ggt gag ggc cgt gca gag tot gtg ctg ctg cgc ggt gac cac	2981
Ile Leu Gly Glu Gly Arg Ala Glu Ser Val Leu Leu Arg Gly Asp His	
975 980 985	
aca cga tgc aag act gtg ctc acc ago aag gtg ggc ggc ctc ttg goo	3029
Thr Arg Cys Lys Thr Val Leu Thr Ser Lys Val Gly Gly Leu Leu Ala	
990 995 1000	
tto acc aag cgo cgo aac tgt tgc att ggc tgc cgc too gta ato	3074

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Phe Thr Lys	Arg Arg Asn Cys Cys	Ile Gly Cys Arg Ser	Val Ile	
1005	1010	1015		
gag cat caa	gga ggc gtg tgt aag	ttc tgt cag cca cgg	gag tcg	3119
Asp His Gln	Gly Ala Val Cys Lys	Phe Cys Gln Pro Arg	Glu Ser	
1020	1025	1030		
gag cto tat	cag aag gag gtg tca	cac ctg aat gcc ttg	gaa gaa	3164
Glu Leu Tyr	Gln Lys Glu Val Ser	His Leu Asn Ala Leu	Glu Glu	
1035	1040	1045		
cgg ttc tot	cgc ctc tgg aca cag	tgt caa cgc tgc cag	ggc agc	3209
Arg Phe Ser	Arg Leu Trp Thr Gln	Cys Gln Arg Cys Gln	Gly Ser	
1050	1055	1060		
ttg cat gag	gac gtc atc tgt acc	agc cgt gac tgt ooo	atc ttc	3254
Leu His Glu	Asp Val Ile Cys Thr	Ser Arg Asp Cys Pro	Ile Phe	
1065	1070	1075		
tac atg cgc	aag aag gtg cgc aag	gac ctg gaa gac cag	gaa cgg	3299
Tyr Met Arg	Lys Lys Val Arg Lys	Asp Leu Glu Asp Gln	Glu Arg	
1080	1085	1090		
ctg ctg cag	cgc ttt gga ccg ooo	ggc cct gag gcc tgg	tga	3341
Leu Leu Gln	Arg Phe Gly Pro Pro	Gly Pro Glu Ala Trp		
1095	1100	1105		
cctgacacgg	gacaag			3357

<210> 87
 <211> 1105
 <212> PRT
 <213> Mus musculus

<400> 87

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Met Asp Cys Lys Arg Arg Gln Gly Pro Gly Pro Gly Val Pro Pro Lys
1 5 10 15

Arg Ala Arg Gly His Leu Trp Asp Glu Asp Glu Pro Ser Pro Ser Gln
20 25 30

Phe Glu Ala Asn Leu Ala Leu Leu Glu Glu Ile Glu Ala Glu Asn Arg
35 40 45

Leu Gln Glu Ala Glu Glu Glu Leu Gln Leu Pro Pro Glu Gly Thr Val
50 55 60

Gly Gly Gln Phe Ser Thr Ala Asp Ile Asp Pro Arg Trp Arg Arg Pro
65 70 75 80

Thr Leu Arg Ala Leu Asp Pro Ser Thr Glu Pro Leu Ile Phe Gln Gln
85 90 95

Leu Glu Ile Asp His Tyr Val Gly Ser Ala Pro Pro Leu Pro Glu Gly
100 105 110

Pro Leu Pro Ser Arg Asn Ser Val Pro Ile Leu Arg Ala Phe Gly Val
115 120 125

Thr Asp Glu Gly Phe Ser Val Cys Cys His Ile Gln Gly Phe Ala Pro
130 135 140

Tyr Phe Tyr Thr Pro Ala Pro Pro Gly Phe Gly Ala Glu His Leu Ser

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145	150	155	160
Glu Leu Gln Gln Glu Leu Asn Ala Ala Ile Ser Arg Asp Gln Arg Gly			
	165	170	175
Gly Lys Glu Leu Ser Gly Pro Ala Val Leu Ala Ile Glu Leu Cys Ser			
	180	185	190
Arg Glu Ser Met Phe Gly Tyr His Gly His Gly Pro Ser Pro Phe Leu			
	195	200	205
Arg Ile Thr Leu Ala Leu Pro Arg Leu Met Ala Pro Ala Arg Arg Leu			
	210	215	220
Leu Glu Gln Gly Val Arg Val Pro Gly Leu Gly Thr Pro Ser Phe Ala			
	225	230	235 240
Pro Tyr Glu Ala Asn Val Asp Phe Glu Ile Arg Phe Met Val Asp Ala			
	245	250	255
Asp Ile Val Gly Cys Asn Trp Leu Glu Leu Pro Ala Gly Lys Tyr Val			
	260	265	270
Arg Arg Ala Glu Lys Lys Ala Thr Leu Cys Gln Leu Glu Val Asp Val			
	275	280	285
Leu Trp Ser Asp Val Ile Ser His Pro Pro Glu Gly Gln Trp Gln Arg			
	290	295	300

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Ile Ala Pro Leu Arg Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg
305 310 315 320

Lys Gly Ile Phe Pro Glu Pro Glu Arg Asp Pro Val Ile Gln Ile Cys
325 330 335

Ser Leu Gly Leu Arg Trp Gly Glu Pro Glu Pro Phe Leu Arg Leu Ala
340 345 350

Leu Thr Leu Arg Pro Cys Ala Pro Ile Leu Gly Ala Lys Val Gln Ser
355 360 365

Tyr Glu Arg Glu Glu Asp Leu Leu Gln Ala Trp Ala Asp Phe Ile Leu
370 375 380

Ala Met Asp Pro Asp Val Ile Thr Gly Tyr Asn Ile Gln Asn Phe Asp
385 390 395 400

Leu Pro Tyr Leu Ile Ser Arg Ala Gln Ala Leu Lys Val Asp Arg Phe
405 410 415

Pro Phe Leu Gly Arg Val Thr Gly Leu Arg Ser Asn Ile Arg Asp Ser
420 425 430

Ser Phe Gln Ser Arg Gln Val Gly Arg Arg Asp Ser Lys Val Ile Ser
435 440 445

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Met Val Gly Arg Val Gln Met Asp Met Leu Gln Val Leu Leu Arg Glu
450 455 460

His Lys Leu Arg Ser Tyr Thr Leu Asn Ala Val Ser Phe His Phe Leu
465 470 475 480

Gly Glu Gln Lys Glu Asp Val Gln His Ser Ile Ile Thr Asp Leu Gln
485 490 495

Asn Gly Asn Glu Gln Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu Lys
500 505 510

Asp Ala Phe Leu Pro Leu Arg Leu Leu Glu Arg Leu Met Val Leu Val
515 520 525

Asn Asn Val Glu Met Ala Arg Val Thr Gly Val Pro Leu Gly Tyr Leu
530 535 540

Leu Thr Arg Gly Gln Gln Val Lys Val Val Ser Gln Leu Leu Arg Gln
545 550 555 560

Ala Met Arg Gln Gly Leu Leu Met Pro Val Val Lys Thr Glu Gly Ser
565 570 575

Glu Asp Tyr Thr Gly Ala Thr Val Ile Glu Pro Leu Lys Gly Tyr Tyr
580 585 590

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Asp Val Pro Ile Ala Thr Leu Asp Phe Ser Ser Leu Tyr Pro Ser Ile
595 600 605

Met Met Ala His Asn Leu Cys Tyr Thr Thr Leu Leu Arg Pro Gly Ala
610 615 620

Ala Gln Lys Leu Gly Leu Lys Pro Asp Glu Phe Ile Lys Thr Pro Thr
625 630 635 640

Gly Asp Glu Phe Val Lys Ser Ser Val Arg Lys Gly Leu Leu Pro Gln
645 650 655

Ile Leu Glu Asn Leu Leu Ser Ala Arg Lys Arg Ala Lys Ala Glu Leu
660 665 670

Ala Gln Glu Thr Asp Pro Leu Arg Arg Gln Val Leu Asp Gly Arg Gln
675 680 685

Leu Ala Leu Lys Val Ser Ala Asn Ser Val Tyr Gly Phe Thr Gly Ala
690 695 700

Gln Val Gly Lys Leu Pro Cys Leu Glu Ile Ser Gln Ser Val Thr Gly
705 710 715 720

Phe Gly Arg Gln Met Ile Glu Lys Thr Lys Gln Leu Val Glu Ser Lys
725 730 735

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Tyr Thr Val Glu Asn Gly Tyr Asp Ala Asn Ala Lys Val Val Tyr Gly
740 745 750

Asp Thr Asp Ser Val Met Cys Arg Phe Gly Val Ser Ser Val Ala Glu
755 760 765

Ala Met Ser Leu Gly Arg Glu Ala Ala Asn Trp Val Ser Ser His Phe
770 775 780

Pro Ser Pro Ile Arg Leu Glu Phe Glu Lys Val Tyr Phe Pro Tyr Leu
785 790 795 800

Leu Ile Ser Lys Lys Arg Tyr Ala Gly Leu Leu Phe Ser Ser Arg Ser
805 810 815

Asp Ala His Asp Lys Met Asp Cys Lys Gly Leu Glu Ala Val Arg Arg
820 825 830

Asp Asn Cys Pro Leu Val Ala Asn Leu Val Thr Ser Ser Leu Arg Arg
835 840 845

Ile Leu Val Asp Arg Asp Pro Asp Gly Ala Val Ala His Ala Lys Asp
850 855 860

Val Ile Ser Asp Leu Leu Cys Asn Arg Ile Asp Ile Ser Gln Leu Val
865 870 875 880

Ile Thr Lys Glu Leu Thr Arg Ala Ala Ala Asp Tyr Ala Gly Lys Gln

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885

890

895

Ala His Val Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Pro Gly Ser
900 905 910

Ala Pro Ser Leu Gly Asp Arg Val Pro Tyr Val Ile Ile Gly Ala Ala
915 920 925

Lys Gly Val Ala Ala Tyr Met Lys Ser Glu Asp Pro Leu Phe Val Leu
930 935 940

Glu His Ser Leu Pro Ile Asp Thr Gln Tyr Tyr Leu Glu Gln Gln Leu
945 950 955 960

Ala Lys Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu Gly Glu Gly Arg
965 970 975

Ala Glu Ser Val Leu Leu Arg Gly Asp His Thr Arg Cys Lys Thr Val
980 985 990

Leu Thr Ser Lys Val Gly Gly Leu Leu Ala Phe Thr Lys Arg Arg Asn
995 1000 1005

Cys Cys Ile Gly Cys Arg Ser Val Ile Asp His Gln Gly Ala Val
1010 1015 1020

Cys Lys Phe Cys Gln Pro Arg Glu Ser Glu Leu Tyr Gln Lys Glu
1025 1030 1035

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Val Ser His Leu Asn Ala Leu Glu Glu Arg Phe Ser Arg Leu Trp
 1040 1045 1050

Thr Gln Cys Gln Arg Cys Gln Gly Ser Leu His Glu Asp Val Ile
 1055 1060 1065

Cys Thr Ser Arg Asp Cys Pro Ile Phe Tyr Met Arg Lys Lys Val
 1070 1075 1080

Arg Lys Asp Leu Glu Asp Gln Glu Arg Leu Leu Gln Arg Phe Gly
 1085 1090 1095

Pro Pro Gly Pro Glu Ala Trp
 1100 1105

<210> 88

<211> 3318

<212> DNA

<213> Mus musculus

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<221> CDS

<222> (1).. (3318)

<400> 88

atg gat tgt aag cgg cga can gga cca ggc cct ggg gtg ccc cca aag 48
 Met Asp Cys Lys Arg Arg Gln Gly Pro Gly Pro Gly Val Pro Pro Lys
 1 5 10 15

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egg got cga ggg cac oto tgg gat gag gac gag oot tog cag tog cag	96
Arg Ala Arg Gly His Leu Trp Asp Glu Asp Glu Pro Ser Pro Ser Gln	
20 25 30	
ttt gag gcg aac ctg gca ctg otg gag gaa ata gag got gag gac cgg	144
Phe Glu Ala Asn Leu Ala Leu Leu Glu Glu Ile Glu Ala Glu Asn Arg	
35 40 45	
ctg cag gag gca gag gag gag ctg cag ctg ccc oca gag ggo acc gtg	192
Leu Gln Glu Ala Glu Glu Glu Leu Gln Leu Pro Pro Glu Gly Thr Val	
50 55 60	
ggt ggg cag ttt too aot gca gac att gao oot cgg tgg cgg cgg ccc	240
Gly Gly Gln Phe Ser Thr Ala Asp Ile Asp Pro Arg Trp Arg Arg Pro	
65 70 75 80	
acc cta cgt gcc ctg gac ccc agc aag gag ccc oto ato tto cag cag	288
Thr Leu Arg Ala Leu Asp Pro Ser Thr Glu Pro Leu Ile Phe Gln Gln	
85 90 95	
ctg gag att gao cac tat gtg ggc tca gca cca ccc ctg oca gaa ggg	336
Leu Glu Ile Asp His Tyr Val Gly Ser Ala Pro Pro Leu Pro Glu Gly	
100 105 110	
ccc ctg cca too cgg aac tca gtg ccc ata ctg agg gcc ttt ggg gtc	384
Pro Leu Pro Ser Arg Asn Ser Val Pro Ile Leu Arg Ala Phe Gly Val	
115 120 125	
acc gat gaa ggc ttc too gtc tgc tgc cac ata cag ggo ttt gcc ccc	432
Thr Asp Glu Gly Phe Ser Val Cys Cys His Ile Gln Gly Phe Ala Pro	
130 135 140	
tao tto tao acc oco gag oot cct ggt ttt ggg goo gag cac ctg agt	480
Tyr Phe Tyr Thr Pro Ala Pro Pro Gly Phe Gly Ala Glu His Leu Ser	
145 150 155 160	

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gag ctg cag cag gag ctg aac goa ggc atc agc cgg gac cag cgc ggt	528
Glu Leu Gln Gln Glu Leu Asn Ala Ala Ile Ser Arg Asp Gln Arg Gly	
165 170 175	
ggg aag gag oto tca ggg ccg gca gtg ctg gca ata gag ota tgc too	576
Gly Lys Glu Leu Ser Gly Pro Ala Val Leu Ala Ile Glu Leu Cys Ser	
180 185 190	
cgt gag agc atg ttt ggg tac cac ggt cat ggc oot tot oca ttt oto	624
Arg Glu Ser Met Phe Gly Tyr His Gly His Gly Pro Ser Pro Phe Leu	
195 200 205	
ggc ato acc ctg gca cta ccc cgc ott atg goa oca ggc cgc cgc ott	672
Arg Ile Thr Leu Ala Leu Pro Arg Leu Met Ala Pro Ala Arg Arg Leu	
210 215 220	
ctg gaa oag ggt gtc oga gtg oca ggc ctg ggc acc ccg agc ttc gca	720
Leu Glu Gln Gly Val Arg Val Pro Gly Leu Gly Thr Pro Ser Phe Ala	
225 230 235 240	
ccc tac gaa ggc aac gtg gac ttt gag atc cgg ttc atg gtg gat got	768
Pro Tyr Glu Ala Asn Val Asp Phe Glu Ile Arg Phe Met Val Asp Ala	
245 250 255	
gac att gtg gga tgc aac tgg ttg gag ctg oca got gga aag tac gtt	816
Asp Ile Val Gly Cys Asn Trp Leu Glu Leu Pro Ala Gly Lys Tyr Val	
260 265 270	
cgg agg ggc gag aag aag ggc acc ctg tgt cag ctg gag gtg gac gtg	864
Arg Arg Ala Glu Lys Lys Ala Thr Leu Cys Gln Leu Glu Val Asp Val	
275 280 285	
ctg tgg tca gat gtg ato agt cac oca ccg gag ggg cag tgg cag ogo	912
Leu Trp Ser Asp Val Ile Ser His Pro Pro Glu Gly Gln Trp Gln Arg	
290 295 300	
att gca ccc ctg cgt gtg ctt ago tto gac atc gag tgt got ggc oga	960

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Ile Ala Pro Leu Arg Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg			
305	310	315	320
aaa ggc atc ttc cct gag cct gag cgt gac coo gtg ato cag ato tgt			1008
Lys Gly Ile Phe Pro Glu Pro Glu Arg Asp Pro Val Ile Gln Ile Cys			
325	330	335	
tat ctg ggg ctg cgc tgg ggg gag ccg gag coa tto ttg cgt ctg goa			1056
Ser Leu Gly Leu Arg Trp Gly Glu Pro Glu Pro Phe Leu Arg Leu Ala			
340	345	350	
cto acg ctg cgg coo tgt gcc coo ato ctg ggt gcc aaa gtg cag agc			1104
Leu Thr Leu Arg Pro Cys Ala Pro Ile Leu Gly Ala Lys Val Gln Ser			
355	360	365	
tat gag cgg gaa gaa gac ctg cto cag gcc tgg gcc gao tto ato ctt			1152
Tyr Glu Arg Glu Glu Asp Leu Leu Gln Ala Trp Ala Asp Phe Ile Leu			
370	375	380	
gcc atg gac cot gac gtg ato acc ggc tac aac att cag aao ttt gcc			1200
Ala Met Asp Pro Asp Val Ile Thr Gly Tyr Asn Ile Gln Asn Phe Ala			
385	390	395	400
cto caa tac cto ato tot ogg goa cag gcc cta aag gtg gac cgc ttc			1248
Leu Pro Tyr Leu Ile Ser Arg Ala Gln Ala Leu Lys Val Asp Arg Phe			
405	410	415	
cct ttc ctg ggc cgo gtg act ggt oto cgc too aac ato cgt gao too			1296
Pro Phe Leu Gly Arg Val Thr Gly Leu Arg Ser Asn Ile Arg Asp Ser			
420	425	430	
too tto caa toa agg cag gtc ggc cgg cgg gac agt aag gtg ato ago			1344
Ser Phe Gln Ser Arg Gln Val Gly Arg Arg Asp Ser Lys Val Ile Ser			
435	440	445	
atg gtg ggt cgc gtt cag atg gat atg ctg cag gtg ctg ctt cgg gaa			1392
Met Val Gly Arg Val Gln Met Asp Met Leu Gln Val Leu Leu Arg Glu			

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450	455	460	
cao aag oto ogo too tac acg ctc aac gct gtg agt ttc cac tto otg His Lys Leu Arg Ser Tyr Thr Leu Asn Ala Val Ser Phe His Phe Leu			1440
465	470	475	480
ggc gag cag aag gag gac gtt cag cao ago ato atc aoc gao otg cag Gly Glu Gln Lys Glu Asp Val Gln His Ser Ile Ile Thr Asp Leu Gln			1488
485	490	495	
aat ggg aac gaa cag acg cgc cgc cgc ctg goo gtg tao tgo otg aag Asn Gly Asn Glu Gln Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu Lys			1536
500	505	510	
gac goo ttt ctg oca oto oga ota ota gag ogo ott atg gtg ctg gtg Asp Ala Phe Leu Pro Leu Arg Leu Leu Glu Arg Leu Met Val Leu Val			1584
515	520	525	
aat aat gtg gag atg gcg cgt gto acg ggt gta oco ott ggg tao ctg Asn Asn Val Glu Met Ala Arg Val Thr Gly Val Pro Leu Gly Tyr Leu			1632
530	535	540	
oto aoc cgg ggc cag cag gtc aag gtc gtg tot cag otg otg ogo cag Leu Thr Arg Gly Gln Gln Val Lys Val Val Ser Gln Leu Leu Arg Gln			1680
545	550	555	560
gcc atg ogo cag ggg ctg ctg atg oot gtg gtg aag aoc gag ggc agt Ala Met Arg Gln Gly Leu Leu Met Pro Val Val Lys Thr Glu Gly Ser			1728
565	570	575	
gag gao tao aog gga gcc aca gto att gag oco oto aaa ggg tao tat Glu Asp Tyr Thr Gly Ala Thr Val Ile Glu Pro Leu Lys Gly Tyr Tyr			1776
580	585	590	
gac gtc ooc att gcc acc ctg gac tto too too ttg tac oca too atc Asp Val Pro Ile Ala Thr Leu Asp Phe Ser Ser Leu Tyr Pro Ser Ile			1824
595	600	605	

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atg atg goo cat aat ctg tgo tac acc aag ctg oto oga oot ggg got	1872
Met Met Ala His Asn Leu Cys Tyr Thr Thr Leu Leu Arg Pro Gly Ala	
610 615 620	
goo cag aag ctg ggc ctt aaa cca gat gag ttc atc aag aca ccc act	1920
Ala Gln Lys Leu Gly Leu Lys Pro Asp Glu Phe Ile Lys Thr Pro Thr	
625 630 635 640	
ggg gat gag ttt gtg aag tca tot gta cgg aag ggc oto ctg ccc cag	1968
Gly Asp Glu Phe Val Lys Ser Ser Val Arg Lys Gly Leu Leu Pro Gln	
645 650 655	
atc ctg gag aat ctg ctg agt goo ogo aag agg goo aag got gag ctg	2016
Ile Leu Glu Asn Leu Leu Ser Ala Arg Lys Arg Ala Lys Ala Glu Leu	
660 665 670	
got cag gag aag gao ooo ctg cgg oga cag gtc ttg gac ggc cgg caa	2064
Ala Gln Glu Thr Asp Pro Leu Arg Arg Gln Val Leu Asp Gly Arg Gln	
675 680 685	
ctg gca cta aaa gtg agt goo aac too gta tat ggc tto aot ggt gcc	2112
Leu Ala Leu Lys Val Ser Ala Asn Ser Val Tyr Gly Phe Thr Gly Ala	
690 695 700	
cag gtg ggc aag ctg cca tgt ttg gag atc too oag agt gtc aot ggg	2160
Gln Val Gly Lys Leu Pro Cys Leu Glu Ile Ser Gln Ser Val Thr Gly	
705 710 715 720	
tto ggg cgg cag atg att gag aaa acc aag cag ctt gtg gag tcc aag	2208
Phe Gly Arg Gln Met Ile Glu Lys Thr Lys Gln Leu Val Glu Ser Lys	
725 730 735	
tac acc gtg gaa aat ggc tac gat gcc aac goo aag gta gtc tac ggt	2256
Tyr Thr Val Glu Asn Gly Tyr Asp Ala Asn Ala Lys Val Val Tyr Gly	
740 745 750	

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gac aac gac tct gtg atg tgc cgg ttt ggc gtc too tct gtg gct gaa	2304
Asp Thr Asp Ser Val Met Cys Arg Phe Gly Val Ser Ser Val Ala Glu	
755 760 765	
gca atg tct ctg ggg cgg gag gct gca aac tgg gta too agt cac ttc	2352
Ala Met Ser Leu Gly Arg Glu Ala Ala Asn Trp Val Ser Ser His Phe	
770 775 780	
cca tca ccc atc cgg ctg gag ttc gag aag gtt tac ttc cca taa ctg	2400
Pro Ser Pro Ile Arg Leu Glu Phe Glu Lys Val Tyr Phe Pro Tyr Leu	
785 790 795 800	
oto ato agc aag aag cgc tat gct ggc ctg oto ttc too too cgc tct	2448
Leu Ile Ser Lys Lys Arg Tyr Ala Gly Leu Leu Phe Ser Ser Arg Ser	
805 810 815	
gat gcc cat gac aaa atg gac tgc aag ggc ctg gag gct gtg cgc agg	2496
Asp Ala His Asp Lys Met Asp Cys Lys Gly Leu Glu Ala Val Arg Arg	
820 825 830	
gac aac tgt ccc ctg gtg gcc aac ctg gtt aca too tct ctg cgc cgg	2544
Asp Asn Cys Pro Leu Val Ala Asn Leu Val Thr Ser Ser Leu Arg Arg	
835 840 845	
atc ctc gtg gac cgg gac cct gat ggg gca gta gac cat gcc aag gac	2592
Ile Leu Val Asp Arg Asp Pro Asp Gly Ala Val Ala His Ala Lys Asp	
850 855 860	
gtc atc tgc gac ctg ctg tgc aac cgc ata gac atc too cag ctg gtc	2640
Val Ile Ser Asp Leu Leu Cys Asn Arg Ile Asp Ile Ser Gln Leu Val	
865 870 875 880	
atc acc aaa gag ttg acc cgc gca gca gca gac tat gct ggc aag cag	2688
Ile Thr Lys Glu Leu Thr Arg Ala Ala Ala Asp Tyr Ala Gly Lys Gln	
885 890 895	
gct cac gtg gag ctg gct gag aag atg agg aag cgc gac ccc ggc agt	2736

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Ala His Val Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Pro Gly Ser	
900 905 910	
gag ccc ago ctg ggt gao oga gtc ccc tat gtg atc att ggt gct got	2784
Ala Pro Ser Leu Gly Asp Arg Val Pro Tyr Val Ile Ile Gly Ala Ala	
915 920 925	
aag ggt gtg gcc gcc tao atg aag tog gag gao ccc ctg ttt gtg ctg	2832
Lys Gly Val Ala Ala Tyr Met Lys Ser Glu Asp Pro Leu Phe Val Leu	
930 935 940	
gag cac ago ctg ccc atc gac act cag tac tac ctg gag cag cag ctg	2880
Glu His Ser Leu Pro Ile Asp Thr Gln Tyr Tyr Leu Glu Gln Gln Leu	
945 950 955 960	
gcc aag ccg oto ttg ago atc ttt gag ccc ato ctg ggt gag gcc cgt	2928
Ala Lys Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu Gly Glu Gly Arg	
965 970 975	
gca gag tct gtg ctg ctg cgc ggt gac cac aca oga tgo aag aot gtg	2976
Ala Glu Ser Val Leu Leu Arg Gly Asp His Thr Arg Cys Lys Thr Val	
980 985 990	
ctc acc ago aag gtg gcc gcc ctc ttg gcc ttc acc aag cgc cgc aac	3024
Leu Thr Ser Lys Val Gly Gly Leu Leu Ala Phe Thr Lys Arg Arg Asn	
995 1000 1005	
tgt tgo att ggc tgo cgc too gta ato gac cat caa gga gcc gtg	3069
Cys Cys Ile Gly Cys Arg Ser Val Ile Asp His Gln Gly Ala Val	
1010 1015 1020	
tgt aag ttc tgt oag cca cgg gag tog gag oto tat cag aag gag	3114
Cys Lys Phe Cys Gln Pro Arg Glu Ser Glu Leu Tyr Gln Lys Glu	
1025 1030 1035	
gtg tca cac ctg aat gcc ttg gaa gaa cgg tto tot cgc oto tgg	3159
Val Ser His Leu Asn Ala Leu Glu Glu Arg Phe Ser Arg Leu Trp	

201/236

1040	1045	1050	
aac aag tgt aac ago tgc cag ggc ago ttg cat gag gac gtc atc			3204
Thr Gln Cys Gln Arg Cys Gln Gly Ser Leu His Glu Asp Val Ile			
1055	1060	1065	
tgt acc agc cgt gac tgt ccc atc ttc tac atg cgc aag aag gtg			3249
Cys Thr Ser Arg Asp Cys Pro Ile Phe Tyr Met Arg Lys Lys Val			
1070	1075	1080	
cgc aag gac atg gaa gac cag gaa cgg ctg ctg cag cgc ttt gga			3294
Arg Lys Asp Leu Glu Asp Gln Glu Arg Leu Leu Gln Arg Phe Gly			
1085	1090	1095	
ccc ccc ggc cct gag gcc tgg tga			3318
Pro Pro Gly Pro Glu Ala Trp			
1100	1105		

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 <212> PRT
 <213> Mus musculus

<400> 89

Met	Asp	Cys	Lys	Arg	Arg	Gln	Gly	Pro	Gly	Pro	Gly	Val	Pro	Pro	Lys
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Arg	Ala	Arg	Gly	His	Leu	Trp	Asp	Glu	Asp	Glu	Pro	Ser	Pro	Ser	Gln
			20				25						30		

Phe	Glu	Ala	Asn	Leu	Ala	Leu	Leu	Glu	Glu	Ile	Glu	Ala	Glu	Asn	Arg
		35					40						45		

202/236

Leu Gln Glu Ala Glu Glu Glu Leu Gln Leu Pro Pro Glu Gly Thr Val
50 55 60

Gly Gly Gln Phe Ser Thr Ala Asp Ile Asp Pro Arg Trp Arg Arg Pro
65 70 75 80

Thr Leu Arg Ala Leu Asp Pro Ser Thr Glu Pro Leu Ile Phe Gln Gln
85 90 95

Leu Glu Ile Asp His Tyr Val Gly Ser Ala Pro Pro Leu Pro Glu Gly
100 105 110

Pro Leu Pro Ser Arg Asn Ser Val Pro Ile Leu Arg Ala Phe Gly Val
115 120 125

Thr Asp Glu Gly Phe Ser Val Cys Cys His Ile Gln Gly Phe Ala Pro
130 135 140

Tyr Phe Tyr Thr Pro Ala Pro Pro Gly Phe Gly Ala Glu His Leu Ser
145 150 155 160

Glu Leu Gln Gln Glu Leu Asn Ala Ala Ile Ser Arg Asp Gln Arg Gly
165 170 175

Gly Lys Glu Leu Ser Gly Pro Ala Val Leu Ala Ile Glu Leu Cys Ser
180 185 190

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Arg Glu Ser Met Phe Gly Tyr His Gly His Gly Pro Ser Pro Phe Leu
195 200 205

Arg Ile Thr Leu Ala Leu Pro Arg Leu Met Ala Pro Ala Arg Arg Leu
210 215 220

Leu Glu Gln Gly Val Arg Val Pro Gly Leu Gly Thr Pro Ser Phe Ala
225 230 235 240

Pro Tyr Glu Ala Asn Val Asp Phe Glu Ile Arg Phe Met Val Asp Ala
245 250 255

Asp Ile Val Gly Cys Asn Trp Leu Glu Leu Pro Ala Gly Lys Tyr Val
260 265 270

Arg Arg Ala Glu Lys Lys Ala Thr Leu Cys Gln Leu Glu Val Asp Val
275 280 285

Leu Trp Ser Asp Val Ile Ser His Pro Pro Glu Gly Gln Trp Gln Arg
290 295 300

Ile Ala Pro Leu Arg Val Leu Ser Phe Asp Ile Glu Cys Ala Gly Arg
305 310 315 320

Lys Gly Ile Phe Pro Glu Pro Glu Arg Asp Pro Val Ile Gln Ile Cys
325 330 335

Ser Leu Gly Leu Arg Trp Gly Glu Pro Glu Pro Phe Leu Arg Leu Ala

204/236

340

345

350

Leu Thr Leu Arg Pro Cys Ala Pro Ile Leu Gly Ala Lys Val Gln Ser
355 360 365

Tyr Glu Arg Glu Glu Asp Leu Leu Gln Ala Trp Ala Asp Phe Ile Leu
370 375 380

Ala Met Asp Pro Asp Val Ile Thr Gly Tyr Asn Ile Gln Asn Phe Ala
385 390 395 400

Leu Pro Tyr Leu Ile Ser Arg Ala Gln Ala Leu Lys Val Asp Arg Phe
405 410 415

Pro Phe Leu Gly Arg Val Thr Gly Leu Arg Ser Asn Ile Arg Asp Ser
420 425 430

Ser Phe Gln Ser Arg Gln Val Gly Arg Arg Asp Ser Lys Val Ile Ser
435 440 445

Met Val Gly Arg Val Gln Met Asp Met Leu Gln Val Leu Leu Arg Glu
450 455 460

His Lys Leu Arg Ser Tyr Thr Leu Asn Ala Val Ser Phe His Phe Leu
465 470 475 480

Gly Glu Gln Lys Glu Asp Val Gln His Ser Ile Ile Thr Asp Leu Gln
485 490 495

205/236

Asn Gly Asn Glu Gln Thr Arg Arg Arg Leu Ala Val Tyr Cys Leu Lys

500

505

510

Asp Ala Phe Leu Pro Leu Arg Leu Leu Glu Arg Leu Met Val Leu Val

515

520

525

Asn Asn Val Glu Met Ala Arg Val Thr Gly Val Pro Leu Gly Tyr Leu

530

535

540

Leu Thr Arg Gly Gln Gln Val Lys Val Val Ser Gln Leu Leu Arg Gln

545

550

555

560

Ala Met Arg Gln Gly Leu Leu Met Pro Val Val Lys Thr Glu Gly Ser

565

570

575

Glu Asp Tyr Thr Gly Ala Thr Val Ile Glu Pro Leu Lys Gly Tyr Tyr

580

585

590

Asp Val Pro Ile Ala Thr Leu Asp Phe Ser Ser Leu Tyr Pro Ser Ile

595

600

605

Met Met Ala His Asn Leu Cys Tyr Thr Thr Leu Leu Arg Pro Gly Ala

610

615

620

Ala Gln Lys Leu Gly Leu Lys Pro Asp Glu Phe Ile Lys Thr Pro Thr

625

630

635

640

206/236

Gly Asp Glu Phe Val Lys Ser Ser Val Arg Lys Gly Leu Leu Pro Gln
645 650 655

Ile Leu Glu Asn Leu Leu Ser Ala Arg Lys Arg Ala Lys Ala Glu Leu
660 665 670

Ala Gln Glu Thr Asp Pro Leu Arg Arg Gln Val Leu Asp Gly Arg Gln
675 680 685

Leu Ala Leu Lys Val Ser Ala Asn Ser Val Tyr Gly Phe Thr Gly Ala
690 695 700

Gln Val Gly Lys Leu Pro Cys Leu Glu Ile Ser Gln Ser Val Thr Gly
705 710 715 720

Phe Gly Arg Gln Met Ile Glu Lys Thr Lys Gln Leu Val Glu Ser Lys
725 730 735

Tyr Thr Val Glu Asn Gly Tyr Asp Ala Asn Ala Lys Val Val Tyr Gly
740 745 750

Asp Thr Asp Ser Val Met Cys Arg Phe Gly Val Ser Ser Val Ala Glu
755 760 765

Ala Met Ser Leu Gly Arg Glu Ala Ala Asn Trp Val Ser Ser His Phe
770 775 780

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Pro Ser Pro Ile Arg Leu Glu Phe Glu Lys Val Tyr Phe Pro Tyr Leu
785 790 795 800

Leu Ile Ser Lys Lys Arg Tyr Ala Gly Leu Leu Phe Ser Ser Arg Ser
805 810 815

Asp Ala His Asp Lys Met Asp Cys Lys Gly Leu Glu Ala Val Arg Arg
820 825 830

Asp Asn Cys Pro Leu Val Ala Asn Leu Val Thr Ser Ser Leu Arg Arg
835 840 845

Ile Leu Val Asp Arg Asp Pro Asp Gly Ala Val Ala His Ala Lys Asp
850 855 860

Val Ile Ser Asp Leu Leu Cys Asn Arg Ile Asp Ile Ser Gln Leu Val
865 870 875 880

Ile Thr Lys Glu Leu Thr Arg Ala Ala Ala Asp Tyr Ala Gly Lys Gln
885 890 895

Ala His Val Glu Leu Ala Glu Arg Met Arg Lys Arg Asp Pro Gly Ser
900 905 910

Ala Pro Ser Leu Gly Asp Arg Val Pro Tyr Val Ile Ile Gly Ala Ala
915 920 925

Lys Gly Val Ala Ala Tyr Met Lys Ser Glu Asp Pro Leu Phe Val Leu

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930	935	940
Glu His Ser Leu Pro Ile Asp Thr Gln Tyr Tyr Leu Glu Gln Gln Leu		
945	950	955 960
Ala Lys Pro Leu Leu Arg Ile Phe Glu Pro Ile Leu Gly Glu Gly Arg		
	965	970 975
Ala Glu Ser Val Leu Leu Arg Gly Asp His Thr Arg Cys Lys Thr Val		
	980	985 990
Leu Thr Ser Lys Val Gly Gly Leu Leu Ala Phe Thr Lys Arg Arg Asn		
	995	1000 1005
Cys Cys Ile Gly Cys Arg Ser Val Ile Asp His Gln Gly Ala Val		
	1010	1015 1020
Cys Lys Phe Cys Gln Pro Arg Glu Ser Glu Leu Tyr Gln Lys Glu		
	1025	1030 1035
Val Ser His Leu Asn Ala Leu Glu Glu Arg Phe Ser Arg Leu Trp		
	1040	1045 1050
Thr Gln Cys Gln Arg Cys Gln Gly Ser Leu His Glu Asp Val Ile		
	1055	1060 1065
Cys Thr Ser Arg Asp Cys Pro Ile Phe Tyr Met Arg Lys Lys Val		
	1070	1075 1080

209/236

Arg Lys Asp Leu Glu Asp Gln Glu Arg Leu Leu Gln Arg Phe Gly
1085 1090 1095

Pro Pro Gly Pro Glu Ala Trp
1100 1105

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<211> 3684
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210/236

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<222> (1871).. (1788)

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<222> (1858).. (1941)

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<222> (2040).. (2108)

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<222> (2198).. (2269)

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<222> (2545).. (2672)

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<222> (3122).. (3181)

<400> 90

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211/236

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tccaccaccg gaacattgag acaaatoto gacggtgacg ctgaggttga aaaaaacaat 180

cgaacgcag acgtaccagg aacogaacca tgtatocagc ccattgaaga agaagaaga 240

gaagaaggtg aaaaacgaaa gattgagaat ttgtttgctt tgagcaacca aacotcagga 300

aaaaagagtt aaggtggag tgtctggtt aacoggttta tatocggttc aaattaaaco 360

tattacagtt aacoggttt ttgttttgt togtttgtc aaaaaaaga gaagactctt 420

gtogtogatt agtgccaaag ttgaagttg aaaccttttc tcgaatttt ctgtcagtt 480

ctgagttttt tttccgccc atg gaa atc gac tcc gag aaa att cac gaa agg 533
Met Glu Ile Asp Ser Glu Lys Ile His Glu Arg
1 5 10

aag caa tcc gat taa aat tgc ctg gtacgaactc tattacttta tgcacttga 587
Lys Gln Ser Asp Tyr Asn Ser Leu
15

gtgaagaca aatgtatca ttgtgtgtg tgaotgttcc taattataag tgtacaggct 647

aggttttgtt atotgattot gattttttgc aattgaaga g gat gag aga ttc gag 703
Asp Glu Arg Phe Glu
20

ata cag aag gag atg taa aga ggt cag caa taa agt cag att taa ttt 761
Ile Gln Lys Glu Met Tyr Arg Gly Gln Gln Tyr Ser Gln Ile Tyr Phe
25 30 35 40

gct cgt ctt cat ctc atg aga aca ctt ctc taa tot ctt got oot act 799
Ala Arg Leu His Leu Met Arg Thr Leu Leu Tyr Ser Leu Ala Pro Thr
45 50 55

212/236

tgg aaa tot cat ttg oot g gtcagtgott ttgtttotot catatttgc	848
Trp Lys Ser His Leu Pro	
60	
acaacaacga agagcagttt ttgagaattt tottgggta gatataatta ggtgaattca	908
gtgattttta gggatttttg ctatottatg gattacagtt gagaagatt gotagtattg	968
tttaaattat agatotgaat gtgaatttca tttttgcag tg tgt aag gtt ttg	1021
Val Cys Lys Val Leu	
65	
gga ctt gaa aaa gga aaa gaa tgc ata att gtg gga acc ttg tto aaa	1089
Gly Leu Glu Lys Gly Lys Glu Cys Ile Ile Val Gly Thr Leu Phe Lys	
70 75 80	
cac atg aag ctt aaa oot tgt gtt ctc gat gaa tat tot aaa gag	1114
His Met Lys Leu Lys Pro Cys Val Leu Asp Glu Tyr Ser Lys Glu	
85 90 95	
gttggttttt attaacctot actgtttttt tgagotatgt ctatgctgan tcaatctgag	1174
tatatttaac ataatgaag agg tca gtt act cag ctt gtt aaa oca cat aac	1226
Arg Ser Val Thr Pro Leu Val Lys Pro His Asn	
100 105	
ttt atg cat oot gat gat aat ctg atc ctc gaa gao gag agt agg aga	1274
Phe Met His Pro Asp Asp Asn Leu Ile Leu Glu Asp Glu Ser Gly Arg	
110 115 120 125	
gtt aag ctt act ggt too gca ctt tca oot gcg att tat gtg aca g	1320
Val Lys Leu Ala Gly Ser Ala Leu Ser Pro Ala Ile Tyr Val Thr	
130 135 140	
gtattgaaa tgggttctta ctgtttttac tctatgattt tttccttttt tacaatgttg	1380
caaattcttag agattttgat caagottttoo totottaasa gatgggttct ttaagaaat	1440

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taacgttgaa gactcccggtg cattgtag gt gtt gtt gtt gca ctg cat ggg 1491
Gly Val Val Val Ala Leu His Gly

145

aag gaa act aat gct ggt gaa ttc ttt gtt gag gat gta cta gaa gct 1539
Lys Glu Thr Asn Ala Gly Glu Phe Phe Val Glu Asp Val Leu Glu Ala

150

155

160

ggt tta cca cct cag att gag cgg cct ato gat cta c gtaagtctag 1586
Gly Leu Pro Pro Gln Ile Glu Arg Pro Ile Asp Leu

165

170

175

ctatgtttoto ttocttttgo taacctcctg gcctaatcat ttctataagc aatctctcat 1646

gatacatcca tattgcctct gcag ag gaa gat aaa tat gto gtg tta ttg 1696
Gln Glu Asp Lys Tyr Val Val Leu Leu

180

185

tgg ggc ott tgt att gga ago aaa tgg gct aat ccc ctg cag ttt cag 1744
Ser Gly Leu Cys Ile Gly Ser Lys Ser Ala Asn Pro Leu Gln Phe Gln

190

195

200

ctt ctt gtt gao oat ata act ggg cat ctc gga gat gag gag 1786
Leu Leu Val Asp His Ile Thr Gly His Leu Gly Asp Glu Glu

205

210

215

gttaaatctt cttaacttgc aggttggtca acatattct ttocttaatt tatactttat 1848

gatttgaaca g gaa caa ggc ott gca gca cag ata gtt cat gta gta att 1896
Glu Gln Gly Leu Ala Ala Gln Ile Val His Val Val Ile

220

225

gct gga aac tct ttt gaa ttt ccc cgc aaa ctc att aat ggc cag 1941
Ala Gly Asn Ser Phe Glu Phe Pro Arg Lys Leu Ile Asn Gly Gln

230

235

240

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gtacttataa cttttgttgo tgatatatto tcagatacag ttccagtaat tctctgcccc 2001

agtatgtot tatgatcttt attgattgat ctttgtag aac ttg gac tcg aaa gat 2057

Asn Leu Ala Ser Lys Asp

245

caa tcg aca ctg tat gag ccc atc aaa gag ctt gat atc atg tta ago 2105

Gln Ser Thr Leu Tyr Glu Pro Ile Lys Glu Leu Asp Ile Met Leu Ser

250

255

260

265

cag gtcagttaac tggatctacg tctgtattat ccatctctat tgaatgaaa 2158

Gln

gttcaaaactc ctgttttttt ttttgtggat tgttttttag ata got gca gga gtt 2212

Ile Ala Ala Gly Val

270

toa gta gat atc atg cca ggc acg aat gat cca got aac ttc gca ttg 2260

Ser Val Asp Ile Met Pro Gly Thr Asn Asp Pro Ala Asn Phe Ala Leu

275

280

285

cct cag cag gtctgcaaat acataagaaa cattcaaaat cccgcatttt 2309

Pro Gln Gln

290

gtatcgataa ctctgattaa taggocctto tottttgcto ag cct ctg aat aga 2363

Pro Leu Asn Arg

tgt ctt ttc cct gga tot toa cct tat aac aac ttc aga toa tgt aca 2411

Cys Leu Phe Pro Gly Ser Ser Pro Tyr Asn Thr Phe Arg Ser Cys Thr

295

300

305

310

aat cct cac toa tti gat gtc gat aat atc ag gtatgattat tattaatagt 2463

Asn Pro His Ser Phe Asp Val Asp Asn Ile Arg

315

320

215/236

tgaatacaat otototgatt ttacaacgat aaaattottg gttttatctg actgaaaacc 2523

toatatgggg gcattttgca g a ttt ott gga act tet ggt cag aac atc gat 2575

Phe Leu Gly Thr Ser Gly Gln Asn Ile Asp

325

330

gac ctt ggc aag tac tca gag got aag ago aag ott gat ttt gtg gaa 2623

Asp Leu Gly Lys Tyr Ser Glu Ala Lys Ser Lys Leu Asp Phe Val Glu

335

340

345

aga acg ctg agg tgg aga cat ctt ggc cca act goa cct aat aca oto g 2672

Arg Thr Leu Arg Trp Arg His Leu Ala Pro Thr Ala Pro Asn Thr Leu

350

355

360

gtaagaattc tootigccot gcagattac ttttttgaa taagcccata aaaaaatgat 2732

cotttgagtt ctatttgggt ttgattoact tgcgtacag gt tgt tat cct tto 2785

Gly Cys Tyr Pro Phe

365

acc gat aga gac cct tto ttg att gaa aac tgc cag cat gtc tac ttc 2833

Thr Asp Arg Asp Pro Phe Leu Ile Glu Thr Cys Pro His Val Tyr Phe

370

375

380

gtc ggg aat caa gat aag tat gac aac ogt ttg ata aag g gtaaaagcac 2883

Val Gly Asn Gln Asp Lys Tyr Asp Asn Arg Leu Ile Lys

385

390

395

cttacaaga gattagaat aacattctct tttgtcaaac atcaggcttt aacttttctt 2943

gggtaaatat gaatgctgca g gg tca gaa ggg cag ott gto cgg ttg atc 2993

Gly Ser Glu Gly Gln Leu Val Arg Leu Ile

400

405

tgc att cct aag ttc tgt gag acc ggt att got gtt gcg gtgagtttaa 3042

Cys Ile Pro Lys Phe Cys Glu Thr Gly Ile Ala Val Ala

216/236

410	415	420	
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caocatgtct atttogcag gtg aac ota aga aat ctg gaa tgt cac act tta			3154
	Val Asn Leu Arg Asn Leu Glu Cys His Thr Leu		
	425	430	
ago ttt agc act cag ata aac caa tca taacattgag ttgotacttt			3201
Ser Phe Ser Thr Gln Ile Asn Gln Ser			
435	440		
gtagattat ttotgtott gaagatgtaa ttttagctt tttagtaac aaactotat			3261
gttctaacca aatgtttgtt aaaaatoott ttotttgagt ggaacttcaa aatotttga			3321
tatatigga atgotattg tttgtotaa attttotaaa antotcaga cgaattotta			3381
gtagtcaca taaggacaa aaaggacga ccagatagt tctgttgtt tggtcagaag			3441
aacgtgaaaa gactgcacaa ataattotaa aaaaagcacc aagtgcacag aatotoatgo			3501
aatgtotct ctotototto tcaaggota tatcoatca cacttattac attataaat			3561
taattaaatg caataatga aagcattata ttotccaag gtoaatitto ccgatttcc			3621
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tct			3684

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Gln Gln Tyr Ser Gln Ile Tyr Phe Ala Arg Leu His Leu Met Arg Thr
35 40 45

Leu Leu Tyr Ser Leu Ala Pro Thr Trp Lys Ser His Leu Pro Val Cys
50 55 60

Lys Val Leu Gly Leu Glu Lys Gly Lys Glu Cys Ile Ile Val Gly Thr
65 70 75 80

Leu Phe Lys His Met Lys Leu Lys Pro Cys Val Leu Asp Glu Tyr Ser
85 90 95

Lys Glu Arg Ser Val Thr Pro Leu Val Lys Pro His Asn Phe Met His
100 105 110

Pro Asp Asp Asn Leu Ile Leu Glu Asp Glu Ser Gly Arg Val Lys Leu
115 120 125

Ala Gly Ser Ala Leu Ser Pro Ala Ile Tyr Val Thr Gly Val Val Val
130 135 140

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Ala Leu His Gly Lys Glu Thr Asn Ala Gly Glu Phe Phe Val Glu Asp
145 150 155 160

Val Leu Glu Ala Gly Leu Pro Pro Gln Ile Glu Arg Pro Ile Asp Leu
165 170 175

Gln Glu Asp Lys Tyr Val Val Leu Leu Ser Gly Leu Cys Ile Gly Ser
180 185 190

Lys Ser Ala Asn Pro Leu Gln Phe Gln Leu Leu Val Asp His Ile Thr
195 200 205

Gly His Leu Gly Asp Glu Glu Glu Gln Gly Leu Ala Ala Gln Ile Val
210 215 220

His Val Val Ile Ala Gly Asn Ser Phe Glu Phe Pro Arg Lys Leu Ile
225 230 235 240

Asn Gly Gln Asn Leu Ala Ser Lys Asp Gln Ser Thr Leu Tyr Glu Pro
245 250 255

Ile Lys Glu Leu Asp Ile Met Leu Ser Gln Ile Ala Ala Gly Val Ser
260 265 270

Val Asp Ile Met Pro Gly Thr Asn Asp Pro Ala Asn Phe Ala Leu Pro
275 280 285

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Gln Gln Pro Leu Asn Arg Cys Leu Phe Pro Gly Ser Ser Pro Tyr Asn
290 295 300

Thr Phe Arg Ser Cys Thr Asn Pro His Ser Phe Asp Val Asp Asn Ile
305 310 315 320

Arg Phe Leu Gly Thr Ser Gly Gln Asn Ile Asp Asp Leu Gly Lys Tyr
325 330 335

Ser Glu Ala Lys Ser Lys Leu Asp Phe Val Glu Arg Thr Leu Arg Trp
340 345 350

Arg His Leu Ala Pro Thr Ala Pro Asn Thr Leu Gly Cys Tyr Pro Phe
355 360 365

Thr Asp Arg Asp Pro Phe Leu Ile Glu Thr Cys Pro His Val Tyr Phe
370 375 380

Val Gly Asn Gln Asp Lys Tyr Asp Asn Arg Leu Ile Lys Gly Ser Glu
385 390 395 400

Gly Gln Leu Val Arg Leu Ile Cys Ile Pro Lys Phe Cys Glu Thr Gly
405 410 415

Ile Ala Val Ala Val Asn Leu Arg Asn Leu Glu Cys His Thr Leu Ser
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Phe Ser Thr Gln Ile Asn Gln Ser

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435

440

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221/236

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<222> (2198).. (2289)

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ttccaccacc gaacattgag acaaaatctc gaaggtagc ctgaggttga aaaaaccaat 160

ogaaccgcag acgtaccagg aaccgaacca tgtctcaac ccattgaaga agaagaaga 240

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gaagaagggtg aaaaacgaaa gattgagaat ttgtttgctt tgagcaacca aacctcagga 300
 aaaaagagtt aaggtggag tctctggttc aacoggttta tatccggttc aaattaaccc 360
 tcttacagtt aacoggggtt ttgttttggc tgattgttc ataaaagaaa gaagactctt 420
 gtctcgatt agtgcacaag ttgaaagttg aaaccttttc tcagaatttt ctgctcagtt 480
 ctgagttttt tttcccgcc atg gaa atc gac tcc gag aaa att cac gan agg 533
 Met Glu Ile Asp Ser Glu Lys Ile His Glu Arg
 1 5 10
 aag caa tcc gat tac aat tog ctg gtacgaactc tattacttta tcgacttgta 587
 Lys Gln Ser Asp Tyr Asn Ser Leu
 15
 gtgaaagaca aatgtaatca ttgttggttg tgactgttcc taattataag tgtaagggt 647
 aggttttgtt atotgattct gagtttttgc aattgaagca g gat gag aga ttc gag 703
 Asp Glu Arg Phe Glu
 20
 ata cag aag gag atg tac aga ggt cag caa tac agt cag att tac ttt 751
 Ile Gln Lys Glu Met Tyr Arg Gly Gln Gln Tyr Ser Gln Ile Tyr Phe
 25 30 35 40
 got cgt ctt cat ctg atg aga aca ctt ctg tac tct ott got cct act 799
 Ala Arg Leu His Leu Met Arg Thr Leu Leu Tyr Ser Leu Ala Pro Thr
 45 50 55
 tgg aaa tot cat ttg cct g gtacgtgctt ttgtttctct catatttagc 848
 Trp Lys Ser His Leu Pro
 60
 acaacaaga agagcagttt ttgagaattt tottggttta gatataatta ggtgaatca 908
 gtgattttta gggatttttg ctatcttatg gattacagtt gagaagatt gotagtattg 968

223/236

tttaaattat agatotgaat gtgaatttca tttttgcag tg tgt aag gtt ttg 1021
 Val Cys Lys Val Leu
 65

gga ctt gaa aaa gga aaa gaa tgc ata att gtg gga aoc ttg tto aaa 1069
 Gly Leu Glu Lys Gly Lys Glu Cys Ile Ile Val Gly Thr Leu Phe Lys
 70 75 80

cao atg aag ctt aaa oot tgt gtt oto gat gaa tat tct aaa gag 1114
 His Met Lys Leu Lys Pro Cys Val Leu Asp Glu Tyr Ser Lys Glu
 85 90 95

gttagttttt attaacctot aotgtttttt tgagctatgt ctatgotgaa tcaatctgag 1174

tatatttaac ataatgcag agg tca gtt aot cag ctt gtt aaa cca cat aac 1226
 Arg Ser Val Thr Pro Leu Val Lys Pro His Asn
 100 105

ttt atg cat oot gat gat aat ctg ato oto gaa gao gag agt ggg aga 1274
 Phe Met His Pro Asp Asp Asn Leu Ile Leu Glu Asp Glu Ser Gly Arg
 110 115 120 125

gtt aag ctt got ggt tcc gca ctt tca oot gog att tat gtg aca g 1320
 Val Lys Leu Ala Gly Ser Ala Leu Ser Pro Ala Ile Tyr Val Thr
 130 135 140

gtattgcaaa tgggttctta ctgtttttac tgtatgatt tttccttctt tacaatgttg 1380

caaatottag agattttgat caagctttcc totottaaaa gatgggttot ttaagaaaat 1440

taacgttgaa gcotcccggtg cattgtag gt gtt gtt gtt gca ctg cat ggg 1491
 Gly Val Val Val Ala Leu His Gly
 145

aag gaa aot aat got ggt gaa ttc ttt gtt gag gat gta ota gaa got 1539

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Lys Glu Thr Asn Ala Gly Glu Phe Phe Val Glu Asp Val Leu Glu Ala	
150 155 160	
ggc tta oca oot oag att gag ogg cct atc gat cta c gtaagtctag	1586
Gly Leu Pro Pro Gln Ile Glu Arg Pro Ile Asp Leu	
165 170 175	
ctatgttoto ttocttttgc taacotoatg gctcaatcat tictataagc aatctctcat	1646
gatacatoca tattgcattot goag ag gaa gat aaa tat gtc gtg tta ttg	1696
Gln Glu Asp Lys Tyr Val Val Leu Leu	
180 185	
tgc ggc ctt tgt att gga agc aaa tog got aat ooc otg cag ttt cag	1744
Ser Gly Leu Cys Ile Gly Ser Lys Ser Ala Asn Pro Leu Gln Phe Gln	
190 195 200	
ott ctt gtt gac cat ata act ggc cat cto gga gat gag gag	1786
Leu Leu Val Asp His Ile Thr Gly His Leu Gly Asp Glu Glu	
205 210 215	
gttcaaatot ottaaottgc aggttgttca acatatttct ttocttaatt tatactttat	1846
ggtttgaaca g gaa caa ggc ctt gca gca cag ata gtt cat gta gta att	1896
Glu Gln Gly Leu Ala Ala Gln Ile Val His Val Val Ile	
220 225	
got gga aac tot ttt gaa ttt ooc ogc aaa ctc att aat ggc cag	1941
Ala Gly Asn Ser Phe Glu Phe Pro Arg Lys Leu Ile Asn Gly Gln	
230 235 240	
giacttataa cttttgttgc tgatatatto toagatacag ttocagtaat tatctgcccc	2001
agttatgtot tatgatottt attggttgat otttgtag aac ttg gcc tog aaa gat	2057
Asn Leu Ala Ser Lys Asp	
245	

caa tgg aca atg tat gag oca ato aaa gag att gat ato atg tta agc	2105
Gln Ser Thr Leu Tyr Glu Pro Ile Lys Glu Leu Asp Ile Met Leu Ser	
250 255 260 265	
cag gtcagttaac tggatatacg tgtatattat ccatatctat tggatgaaa	2158
Gln	
gttcaaaactc ctgttttttt ttttgtggat tgttttttag ata gct gca gga gtt	2212
Ile Ala Ala Gly Val	
270	
toa gta gat atc atg oca ggc acg aat gat oca gct aac ttc gca ttg	2260
Ser Val Asp Ile Met Pro Gly Thr Asn Asp Pro Ala Asn Phe Ala Leu	
275 280 285	
oot cag cag gtotgcaaat acataagaaa catcacaat cccgcatttt	2309
Pro Gln Gln	
290	
gtatcgataa ctotgattca taggcaccto tottttttto ag oot atg aat aga	2363
Pro Leu Asn Arg	
tgt att ttc cct gga tct tca cct tat aao aco ttc aga tca tgt aca	2411
Cys Leu Phe Pro Gly Ser Ser Pro Tyr Asn Thr Phe Arg Ser Cys Thr	
295 300 305 310	
aat oot cao tca ttt gct gtc gat aat atc ag gtatgattat tattaatagt	2463
Asn Pro His Ser Phe Ala Val Asp Asn Ile Arg	
315 320	
tgaatacaat ctototgatt ttacaacgat aaattttttg gttttatctg actgaaaacc	2523
toatatgggg gcaattttgca g a ttt att gga act tot ggt cag aac atc gat	2575
Phe Leu Gly Thr Ser Gly Gln Asn Ile Asp	
325 330	

226/236

gag ctt ggc aag tao toa gag got aag ago aag ctt gat ttt gtg gaa 2823
 Asp Leu Gly Lys Tyr Ser Glu Ala Lys Ser Lys Leu Asp Phe Val Glu
 335 340 345

aga acg ctg agg tag aga cat ctt gcc oca act gca cct aat aca oto g 2872
 Arg Thr Leu Arg Trp Arg His Leu Ala Pro Thr Ala Pro Asn Thr Leu
 350 355 360

gtaagaattc tootigcoot gcaagattac ttttttgaac taagococata aaaaaatgat 2732

cotttgagtt ctatttggtt ttgattcaat tgcgtacag gt tgt tat cct ttc 2785
 Gly Cys Tyr Pro Phe
 365

acc gat aga gac cct tto ttg att gaa acc tgc cag cat gtc tao ttc 2833
 Thr Asp Arg Asp Pro Phe Leu Ile Glu Thr Cys Pro His Val Tyr Phe
 370 375 380

gto ggg aat caa gat aaa tat gac aac cgt ttg ata aag g gtaaaagcaa 2883
 Val Gly Asn Gln Asp Lys Tyr Asp Asn Arg Leu Ile Lys
 385 390 395

cttacacaga gattagaaat aacattotet ttgtcaaac atcaggcttt aacttttctt 2943

gggtaaatat gaatgotgca g gg tca gaa ggg cag ctt gtc cgg ttg ato 2993
 Gly Ser Glu Gly Gln Leu Val Arg Leu Ile
 400 405

tgc att cct aag tto tgt gag acc ggt att got gtt gcg gtgatttaa 3042
 Cys Ile Pro Lys Phe Cys Glu Thr Gly Ile Ala Val Ala
 410 415 420

aatttgagca gaatttgaga coatttacc coatagattg cagattotaa atctcaaat 3102

caaatgtot atttgcag gtg aac cta aga aat ctg gaa tgt cac aat tta 3154
 Val Asn Leu Arg Asn Leu Glu Cys His Thr Leu

227/236

425

430

agc ttt agc aot oag ata aac caa tca taacattgag ttgataottt 3201

Ser Phe Ser Ser Thr Gln Ile Asn Gln Ser

435

440

gtagattat ttctgtctt gaagatgta tttgagott tttaagtaac acactootat 3281

gttataaca aatgtttgtt aaaaatoott tttottgagt ggaacttcca aatctttgga 3321

tatattgga atgotcatg ttttgtcta attttctaaa aatctcgaca cgagttotta 3381

gtagtcaca taaaggaca aaaggccga ccagatagtg togtggtgt tggtcagaag 3441

aaagtgaana gactgcanaa ataatttaa aaaaagcaco agtgcacag aatctcatgc 3501

aagtgtctt ctctctcttc tcaacggcta tatccatoca cacttattac attataaat 3561

taattaaatg caataatgta aagcattata ttotocaaag gtccatttto ccgaatttcc 3621

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tot 3684

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<213> Arabidopsis thaliana

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Met Glu Ile Asp Ser Glu Lys Ile His Glu Arg Lys Gln Ser Asp Tyr

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10

15

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Asn Ser Leu Asp Glu Arg Phe Glu Ile Gln Lys Glu Met Tyr Arg Gly
20 25 30

Gln Gln Tyr Ser Gln Ile Tyr Phe Ala Arg Leu His Leu Met Arg Thr
35 40 45

Leu Leu Tyr Ser Leu Ala Pro Thr Trp Lys Ser His Leu Pro Val Cys
50 55 60

Lys Val Leu Gly Leu Glu Lys Gly Lys Glu Cys Ile Ile Val Gly Thr
65 70 75 80

Leu Phe Lys His Met Lys Leu Lys Pro Cys Val Leu Asp Glu Tyr Ser
85 90 95

Lys Glu Arg Ser Val Thr Pro Leu Val Lys Pro His Asn Phe Met His
100 105 110

Pro Asp Asp Asn Leu Ile Leu Glu Asp Glu Ser Gly Arg Val Lys Leu
115 120 125

Ala Gly Ser Ala Leu Ser Pro Ala Ile Tyr Val Thr Gly Val Val Val
130 135 140

Ala Leu His Gly Lys Glu Thr Asn Ala Gly Glu Phe Phe Val Glu Asp
145 150 155 160

Val Leu Glu Ala Gly Leu Pro Pro Gln Ile Glu Arg Pro Ile Asp Leu

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165

170

175

Gln Glu Asp Lys Tyr Val Val Leu Leu Ser Gly Leu Cys Ile Gly Ser
180 185 190

Lys Ser Ala Asn Pro Leu Gln Phe Gln Leu Leu Val Asp His Ile Thr
195 200 205

Gly His Leu Gly Asp Glu Glu Glu Gln Gly Leu Ala Ala Gln Ile Val
210 215 220

His Val Val Ile Ala Gly Asn Ser Phe Glu Phe Pro Arg Lys Leu Ile
225 230 235 240

Asn Gly Gln Asn Leu Ala Ser Lys Asp Gln Ser Thr Leu Tyr Glu Pro
245 250 255

Ile Lys Glu Leu Asp Ile Met Leu Ser Gln Ile Ala Ala Gly Val Ser
260 265 270

Val Asp Ile Met Pro Gly Thr Asn Asp Pro Ala Asn Phe Ala Leu Pro
275 280 285

Gln Gln Pro Leu Asn Arg Cys Leu Phe Pro Gly Ser Ser Pro Tyr Asn
290 295 300

Thr Phe Arg Ser Cys Thr Asn Pro His Ser Phe Ala Val Asp Asn Ile
305 310 315 320

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Arg Phe Leu Gly Thr Ser Gly Gln Asn Ile Asp Asp Leu Gly Lys Tyr
325 330 335

Ser Glu Ala Lys Ser Lys Leu Asp Phe Val Glu Arg Thr Leu Arg Trp
340 345 350

Arg His Leu Ala Pro Thr Ala Pro Asn Thr Leu Gly Cys Tyr Pro Phe
355 360 365

Thr Asp Arg Asp Pro Phe Leu Ile Glu Thr Cys Pro His Val Tyr Phe
370 375 380

Val Gly Asn Gln Asp Lys Tyr Asp Asn Arg Leu Ile Lys Gly Ser Glu
385 390 395 400

Gly Gln Leu Val Arg Leu Ile Cys Ile Pro Lys Phe Cys Glu Thr Gly
405 410 415

Ile Ala Val Ala Val Asn Leu Arg Asn Leu Glu Cys His Thr Leu Ser
420 425 430

Phe Ser Thr Gln Ile Asn Gln Ser
435 440

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<211> 454

<212> DNA

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<213> Mus musculus

<400> 94

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 gatatagaaa caaaagacag gagaanaata atotggcctt ctgataotta ttgaaggot 180
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 aatcacagag ctggatttcc tttaaatto taacaatggc tattgtgcag gagaotttga 360
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<400> 95

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